RAILROAD GAZETTE

FRIDAY, JULY 30, 1897.

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Contributions.

The Boston Elevated Railroad.

NEW YORK, July 23, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Let me add the few words which seem to be necessary to make my position clear as to the Boston elevated railroad plans. It is unfortunate that the cross-girders and columns are to be connected, as in the older types of construction, requiring an excess of metal in both columns and girders without a corresponding stiffness of structure. The curved brackets, added either for ornament (?) or to secure lateral stiffness are quite inadequate in either respect. Lattice girders, if properly designed, are not wholly objectionable, and are sometimes cheaper than plate girders. Any longitudinal girders should be made substantially continuous over three or more spans, and this does not seem to be provided for in the sketches criticised.

Again, it is to be regretted that the tracks are spaced so far apart and the structure widened, as in the older types, without a proportionate immediate gain. If two tracks will answer for many years, as may be possible, the structure need not exceed in width the spacing between the columns, and if more tracks are ever needed two more can be added on brackets when necessary, and the streets occupied have, as in New York City, come to be recognized as elevated railroad streets and accustomed to the presence of the structures.

If the lines are to be used mainly as express lines in connection with the surface lines, the stations can be placed farther apart, the average speed increased and the additional tracks might never be required. In this case the provision for third track would be a waste of material and an unnecessary encroachment on the streets.

It is the *average* speed which must be increased to make such roads successful; this is now about 20 miles an hour for the Manhattan express trains and the maximum speed, required to attain this average, often exceeds 40 miles an hour. In the results of the Chicago experiments, published in your issue of Jan. 20, 1893, it was shown that for one run the distance between stations was 2,700 ft.; the maximum speed was 31 miles an hour and the average speed 20 miles an hour, the engines weighing about 30 tons.

As "Viator" truly says the average speed on elevated roads is now "nearer 12 miles an hour"; this is little better than the average speed on the trolley lines, and unless the elevated roads can increase their average speed to nearly 20 miles an hour, they cannot successfully compete with the trolley lines.

RAPID TRANSIT.

The Present Status of the Electric Railroad.

BOSTON, July 19, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read your editorial in the *Railroad Gazette* of July 9 with much interest, although I cannot agree with your assumptions or the conclusions reached.

"A man who watches human affairs with a little memory and a sense of proportion" will remember that when any new thing (particularly if it have spectacular properties) is brought to the attention of the world, there are always an unfortunate number of enthusiastic men of little knowledge or experience who launch forth a line of far-reaching prophecies as to the immediate revolution which the new art is to work in all past methods. These men, talking loudest and most interestingly, are the ones most listened to by the world and are the cause of popular impatience, disappointment and loss of confidence in even the real value of the new art.

Electrical engineering has suffered greatly in this manner. Up to eight years ago no serious electric railroading of any sort had been done. For two or three years experiments, costly ones, had been carried on. In 1890 the art as applied to street cars had reached a point where it was evident that the electric motor would wholly supersede all other methods of urban public transportation, and that it was likely to extend its sphere beyond ordinary street traffic: this, notwithstanding the fact that the cost of electrical equipment was enormous and many of its characteristics crude and undeveloped. In the short space of seven years that apparatus has reached a perfection of detail, efficiency in operation and low cost of installation and maintenance approached by few of the older and long-used machines. Furthermore, it is a fact, surprising as it may be to some, that the proper and necessary annual "charging off" for depreciation due to wearing out and necessity for replacement on account of newly developed apparatus is less than in the best machine or textile shop practice of to-day.

And this in only seven years, in which short time is it not surprising to find that electric traction has so far advanced beyond its original sphere of urban transportation, with inter-urban highway lines, that within two years it has actually forced itself upon the serious attention of our great steam roads and two of the largest and most important of them have not only made large expenditures in experimental lines independent of each other, but one of those has changed an important, if short, section of its main line into an electric road and announces its policy to rapidly reconstruct other similar parts of its system?

This is a great achievement for a new art, and there is every reason for belief that it is indicative of a gradual change which will unquestionably take years to complete. It is not reasonable to expect more than one step at a time.

It is perfectly evident that in order to meet modern demands for frequent, rapid and clean transportation from centers of population and labor into the surrounding country the steam railroads have got to provide frequent service of small trains, which must be run smoothly, quietly, and with regard to the cleanliness of their passengers. The comfort of passengers is unquestionably best served by the electrically operated small train or single car, and it is also acknowledged that it is the cheapest method of operating them.

Important factors in railroad, as in all other branches of engineering, are in meeting commercial and strategic conditions, demands which must be met as cheaply as possible, of course, but unless they are fully met the people will ride in some other direction or not go. The system providing the cleanest, quietest, most frequent and comfortable accommodations, with a high rate of speed, is the one which will pay best, and this is the view taken of the situation by the New York, New Haven & Hartford and New England railroads in equipping their Hartford-New Britain line. That traffic could not be performed so cheaply by steam as by electric traction, leaving out all other considerations. Undoubtedly the same number of people could be hauled in two or three trains a day by one locomotive much cheaper than by the frequent electric service, but people won't go that way, and unless they will ride the profits in railroading must fall off. You say that the "Nantasket Beach experiment" could be operated cheaper by a dummy service. A dummy service could not have met the popular demands, and for that reason could not have performed the service at all. We are not meeting conditions of 25 years ago, but those of to-day.

Troubles have been met and others will be encountered, both serious and trivial, electrical and mechanical, but they are not in any way insurmountable, and do not affect the necessity for treating that character of service in the general way it has been done.

Street railroad electrical apparatus will probably not change very radically from the form in which it is now used; the trolley wires in large cities will be displaced by other means of transmission as soon as underground or surface conductors are brought into commercial shape. The "trolley," however, is a thoroughly serviceable and good method of carrying the current to the motors; it is cheap to install and maintain, has proved itself reliable and is not found seriously objectionable by the many roads using it, nor their patrons. For service requiring up to 200 H.P. and speeds up to 30 or 40 miles an hour, it is, in its present form, thoroughly satifactory, and, except in intensely populated centers, will be used for many years to come. By changes in details of construction, it will be equally serviceable for the same powers at speeds up to 60 or more miles per hour. For the heavier work which is just now beginning, other and simple methods of getting the current to the moving car and away again have had to be designed to meet the new conditions, and these are being commercially tested to determine the best, just as in the early days the different methods adopted in the first "trolley lines" resulted in the present familiar little pole pushing a big car along so easily. There are no insurmountable obstacles to be overcome.

There are a goodly number now, and the next few years will see an immensely increased number of electric roads built, which may be divided into two classes (not considering the development which will, of course, take place in our city street railroads as population increases). One class will be of comparatively light and cheap construction, making more or less use of highways, starting from convenient market towns or towns having good railroad or water communication, run back into the tributary farming country or interior towns whose business is small, depending upon local natural advantages, but which have in the past been cut off from the railroads for one reason or another. This class of road will serve both passengers and freight. The rolling stock will consist of a few passenger cars used mostly in summer for excursions, etc., a few combination passenger and express cars which will be intended to furnish the regular service, making frequent trips back and forth every day and caring for the passengers perfectly, as well as for the mail, express and small broken freight; finally, one or two freight cars for the heavy part carload freight consignments, electrically equipped, having sufficient traction and power to pull three or four standard loaded freight cars over the grades of four or five per cent. met with on the highways. This class of road has proven itself very profitable when reasonably well handled; they will stay on the highway generally, in order best to accommodate the greatest number of people. The cars will stop anywhere for either passengers or freight. Every outlying district is demanding this service, and is usually quite generous in giving of rights, privileges and bonuses in money and land. The demand for these roads should be met by our existing steam railroads who can build and operate them cheaper and better as feeders to their systems than they can be by small local corporations borrowing their little money at comparatively high rates of interest. The cream of this kind of road is being taken up rapidly, however, by these small corporations, notwithstanding their disadvantage. It is a pity that the conservatism of the great railroads prevents their extension in this manner to the greatest benefit of their own system and that of the people and country tributary to them.

The other class of road referred to is of a quite different character, and supplies the rapid passenger transit from cities into their surburbs. The demand is for faster and faster transportation as people are forced further and further from the post office of their business center. The service can best be rendered by existing steam railroads equipping two tracks electrically, giving very frequent service, working in harmony, and connecting at convenient transfer stations with the local street car lines, which will distribute throughout the city, making unnecessary the expensive terminal facilities required by the present method of handling the commuter. Just so, but how? Leaving him at a great terminal station where he must walk a quarter of a mile to get out of the train shed and then wait for a car. The suburban resident has located conveniently to his "station" on the railroad, and if properly served will continue to do so, for habit is strong and the best and quickest service is wanted, and can be best given by the existing reconstructed steam roads and properly arranged connections with the existing city street service and local feeders in the surburbs. The neglect of this business on the part of the existing steam railroads is resulting in the establishment all over the country of rapid transit electric roads running out of every city, attracting the commuter away from his natural place of residence. The demand for these roads would never have existed had railroad corporations met the reasonable commercial demands, and not forgotten that they, as all other commercial enterprises, are dependent upon the greatest patronage in order to maintain their own. Nevertheless, this character of traffic is being accommodated rapidly by a service not so good as the railroads could give, but better than they do give and so good that they can never recover what is once lost.

Apparatus now in successful operation will easily meet all the requirements of the two classes of roads referred to. Expense of transmission from properly located and efficiently operated power stations is not now a serious item; for short distances the methods now generally employed can best be used. For reasonable distances, 40 to 50 miles, the transmission may be accomplished by means of high potential alternating currents passed through static and rotary converters placed at centers of distribution, transforming the alternating into our every-day 550-volt direct current, which is conducted by ordinary means into the cars. The location of the power station and the kind of prime mover, whether steam or gas engines or water power, should be determined upon in each case with a view to cheap generation; questions of transmission will not materially affect the location, except where there is a choice of two places equally economical for generating.

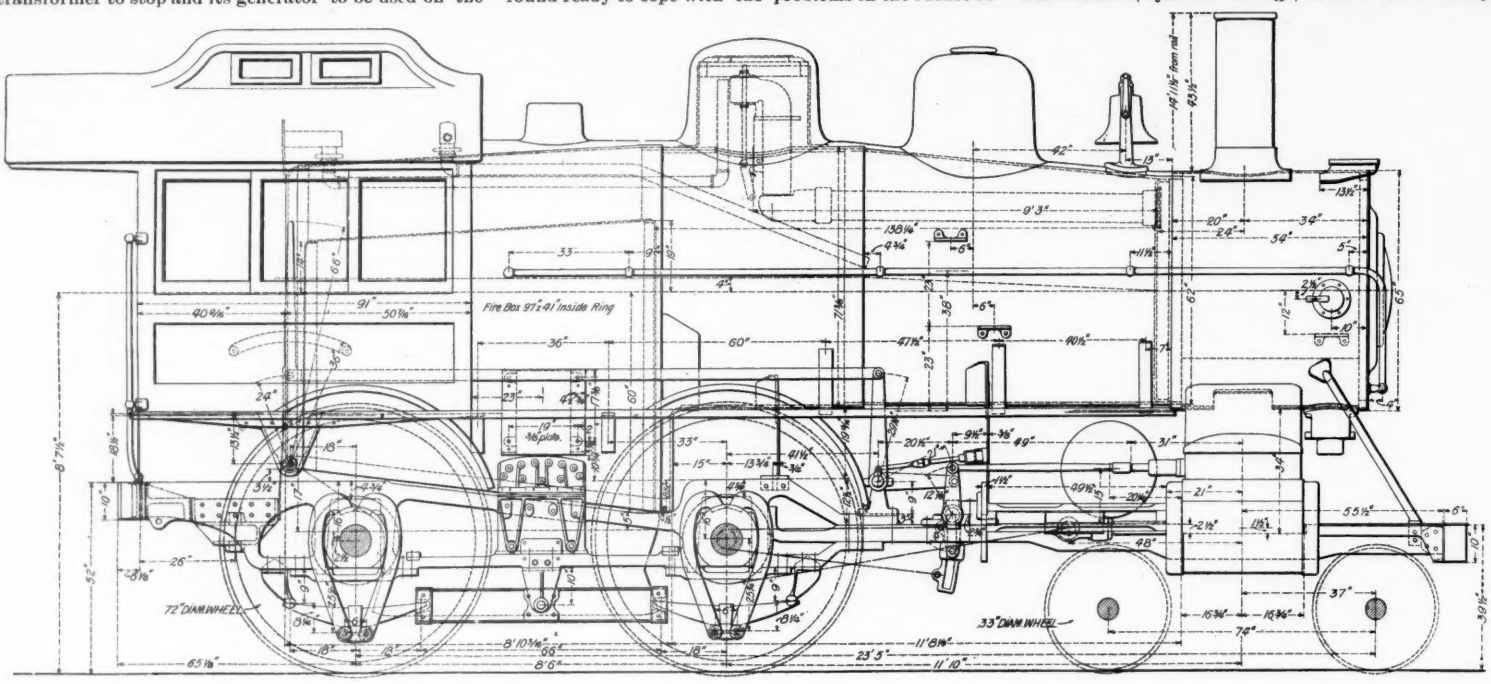
Two examples may be of interest. The Utah Power Co. last year developed a water power of several thousand horse-power and over 400 ft. fall, 15 miles from Salt Lake City. Here they generate an alternating current of 500 volts, by static transformers, raise it to 15,000 volts and transmit to a sub-station centrally located, where other static transformers reduce to 400 volts, which, passing through rotary transformers, is converted into the 550 volts required by their service. As more cars are used, requiring more current, other sub-stations will be established at other convenient points, as far apart as desired; all deriving their power from the same source, 15 miles (it might be 50) away. The loss in transmission and conversion of 3,000 H. P. will be less than 20 per cent. About 2,000 H. P. of generators are now at work.

The other example is now being installed at Montpelier, Vt. A couple of years ago J. S. Viles, of Montpelier, developed a water privilege on the Winooski River, about six miles north of Montpelier, and installed an alternating current generating plant which supplies light and power to Montpelier, Barre and other sur-

rounding towns. The power is used for all kinds of purposes—printing, laundries, machine shops and particularly in the famous granite mills thereabouts. The Montpelier & Barre Traction Co. is now building an electric road between the two places (not properly accommodated by steam roads already there) and placing a generator in Mr. Viles' plant, similar to and interchangeable with those already furnishing power and light, which will transmit 200 H. P. to a rotary transformer station at the Montpelier end of the line and feeding directly into the trolley and feeder system as ordinarily constructed. At Barre, seven miles south, a storage battery will also be attached to the line, of sufficient capacity to operate the road for three hours, the length of time during which the lighting and power work is at the maximum, thus permitting the rotary transformer to stop and its generator to be used on the lighting and power circuits with the others. At other times of the day when the railroad load is light, the rotary will charge the battery, which in turn, as the railroad load becomes heavy, momentarily or for a considerable time, will automatically reverse and help out the rotary in operating the cars, both rotary and battery under these conditions being connected to the line. Again, occasionally some repairs will have to be made in the water plant; then the generating station may be stopped entirely for at least six of the night hours, during which time the battery will pass current through the rotary, delivering alternating current to the lighting and power system. This will indicate how a small power may be made use of for a very large number of horse-power hours per day, and, doing such a variety of kinds of work, lessen the cost of the power for a country road of the class first referred to, and all done with a very moderate investment, upon which a handsome return is sure. There is nothing new in any of this plant; it is simply a case where advantage is taken of all the "goods the gods provide." The system and results would be the same were the road in a coal region and operated by cheap gas or steam.

It will probably be very many years before our transcontinental heavy trains are moved by electric motors deriving their power from generating stations—the apparatus to do this work will probably be of a quite different character than that now seen on our street cars. It is probable that alternating current motors will be used very largely for the heaviest work. The problems to be overcome will have to be met by the long and patient co-operation of the railroad and electrical engineers, and they together will overcome the obstacles in the way, step by step, and each new application will bring forward one more, ultimately resulting in advantage being made of the great water powers and great coal fields so generously distributed over the world. Not this year nor next, but surely, the wasteful steam locomotive will be supplanted.

The progress of electrical science and practice in the past leaves no possible doubt that the profession will be found ready to cope with the problems in the future as successfully and permanently as it has with others of a different nature in the past. F. B. H. PAINE.



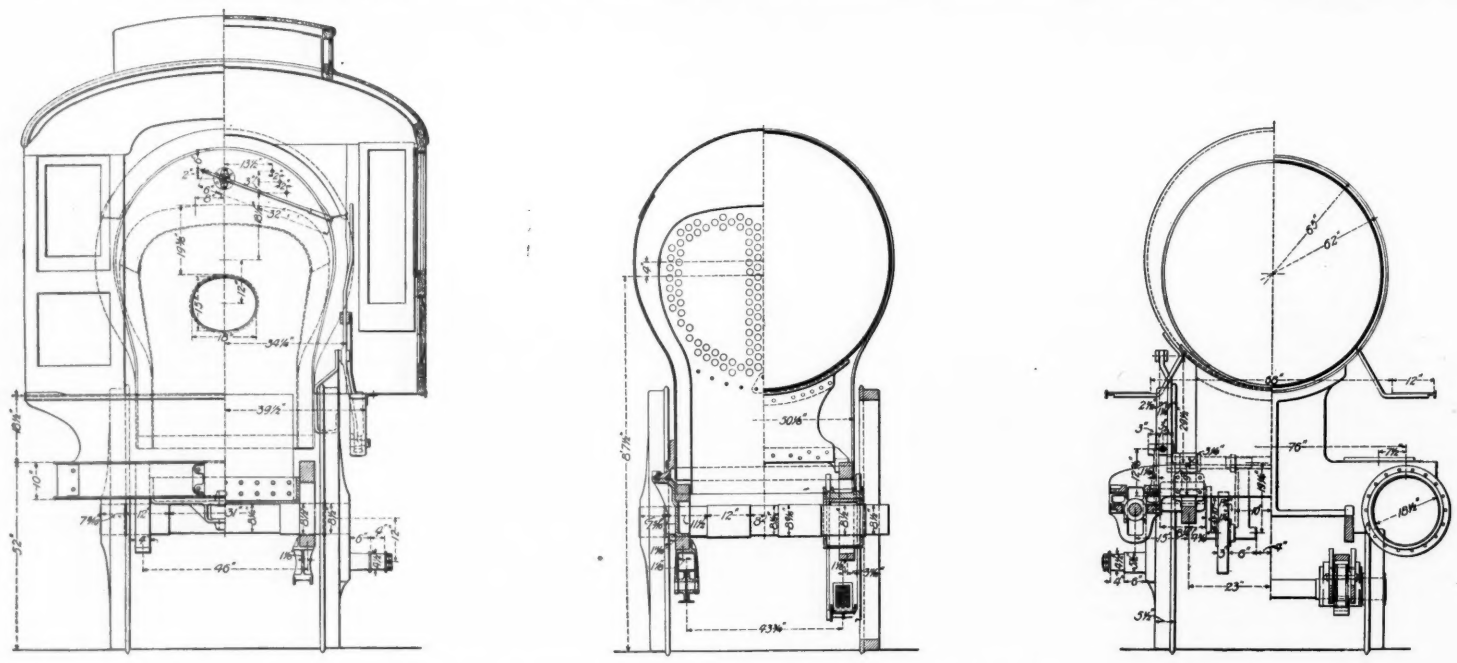


Fig. 2.—New Passenger Locomotive of the Chicago, Indianapolis & Louisville.

Built by the BROOKS LOCOMOTIVE WORKS, *Dunkirk, N. Y.*

New Passenger Engines of the Chicago, Indianapolis & Louisville.

The Brooks Locomotive Works has recently built and delivered to the Chicago, Indianapolis & Louisville Railway two eight-wheel locomotives for use in hauling the through passenger trains between Indianapolis and Chicago. These trains are scheduled to make an average speed of 48 miles an hour, including stops, which makes the average speed in motion about 56 miles per hour. The engines have been in service but a short time and the railroad company is not able to say much about their performance, but they have worked very satisfactorily. The trains which these locomotives haul consist usually of four heavy vestibule cars, weighing 180 tons, although this number is often increased to five and six cars.

The accompanying engravings show the peculiar features of the construction. Fig. 1 shows the general appearance of the engine; Fig. 2, an elevation and cross-sections, while Figs. 3 and 4 show the details of the boiler.

The cylinders are 18 in. in diameter by 26-in. stroke, the drivers are 72 in. in diameter, and the total weight in working order is 121,800 lbs., of which 79,000 lbs. is on the drivers. There are 1,950 sq. ft. of heating surface, and 26.8 sq ft. of grate area. The boiler is of the extended wagon top type, constructed of $\frac{5}{8}$-in. and $\frac{11}{16}$-in. steel plates. The diameter of the barrel is 62 in., and the working steam pressure is 198 lbs per square inch. The tender has a coal capacity of eight tons and a water capacity of 4,000 gals.

The method of equalizing the weight on the driving wheels is shown by Fig. 2, in which a 9-in. steel I-beam takes the place of the usual equalizer bar. Steel castings are used for brackets, equalizer ends and center, and driving spring shoes. In addition to these parts cast steel is used for driving boxes, deck plates, driving wheel centers, cylinder casings, steam chest casings, pistons and cross-heads, reducing the weight of these parts about one-third that of iron castings and making a saving in weight of about 5,000 lbs. for each engine.

The boiler checks are mounted on the top of the boiler inside the cab, while the feed pipe passes through the boiler and delivers the water at about the same point as usual.

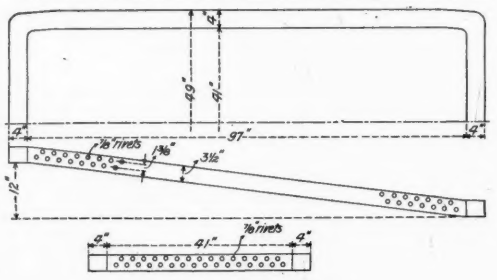


Fig. 4.—Mud Ring.

A flush deck is used, which brings the floor of the cab level with the running board and floor of the tender.

Fig. 3 shows the method of bracing the back head of the boiler by means of ⅛-in. steel gusset plates and the special form of bracing used for the flue sheet below the tubes. It will also be noticed that the diameter of the wagon top is reduced toward the back of the engine, the reason given for this construction being that it permits of the use of shorter boiler stays, and as the shell of the boiler is given the same slope as the crownsheet, the stays in each row are of the same length.

The following are the general dimensions of the engines, together with the names of the makers of the more important special equipment:

General Dimensions.

Wheel base, total, of engine	23 ft. 5 in.
" " driving	8 ft. 6 in.
" " engine and tender	48 ft. 6 in.
Length over all, engine	34 ft. 8½ in.
" " " engine and tender	58 ft. 1½ in.
Height, center of boiler above rails	8 ft. 7½ in.
Height of stack above rails	14 ft. 11⅛ in.
Heating surface, firebox	145.6 sq. ft.
" " tubes	1804.4 sq. ft.
" " total	1,950 sq. ft.
Grate area	26.8 sq. ft.

Wheels and Journals.

Drivers, number	Four
Drivers, diameter	72 in.
" material of centers	Cast steel
Truck wheels, diameter	33¼ in.
Journals, driving axle, size	8½ × 11 in.
" truck " "	5½ × 12 in.
Main crank pin, size	6 × 5½ in.

Cylinders.

Cylinders, diameter	18 in.
Piston, stroke	26 in.
" rod, diameter	3½ in.
Kind of piston-rod packing	United States
Main rod, length center to center	7 ft. 10 in.
Steam ports, length	17 in.
" " width	1¾ in.
Exhaust ports, length	17 in.
" " width	3 in.
Bridge, width	1¾ in.

Valves.

Valves	Richardson balanced
" greatest travel	7 in.
" outside lap	1⅛ in.
" inside lap or clearance	0 in.
" lead in full gear	0 in.
" " constant.	

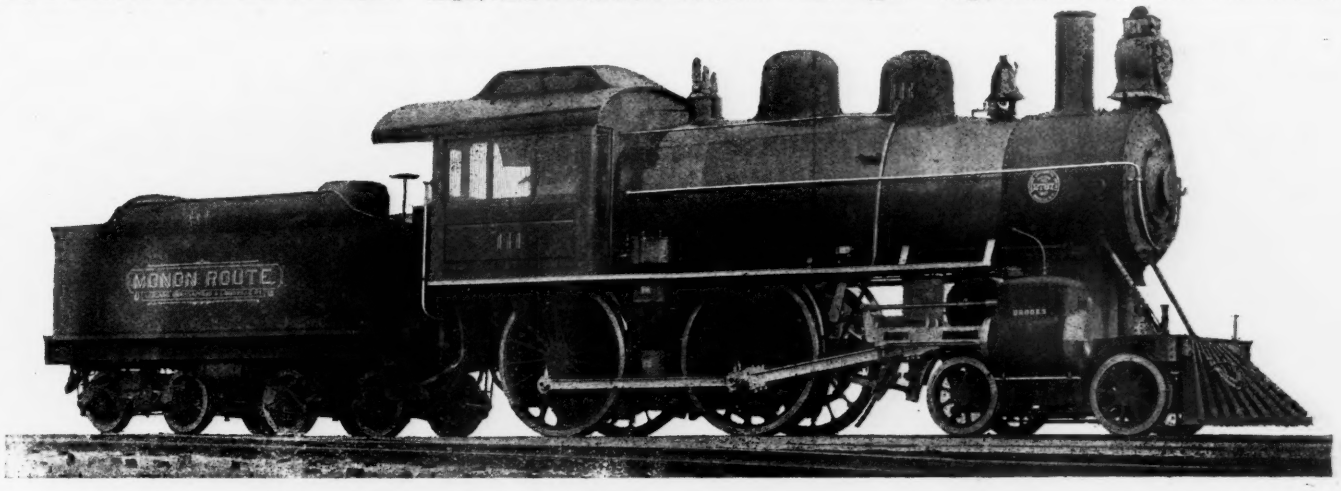


Fig. 1.—Brooks Passenger Locomotive for the Chicago, Indianapolis & Louisville.

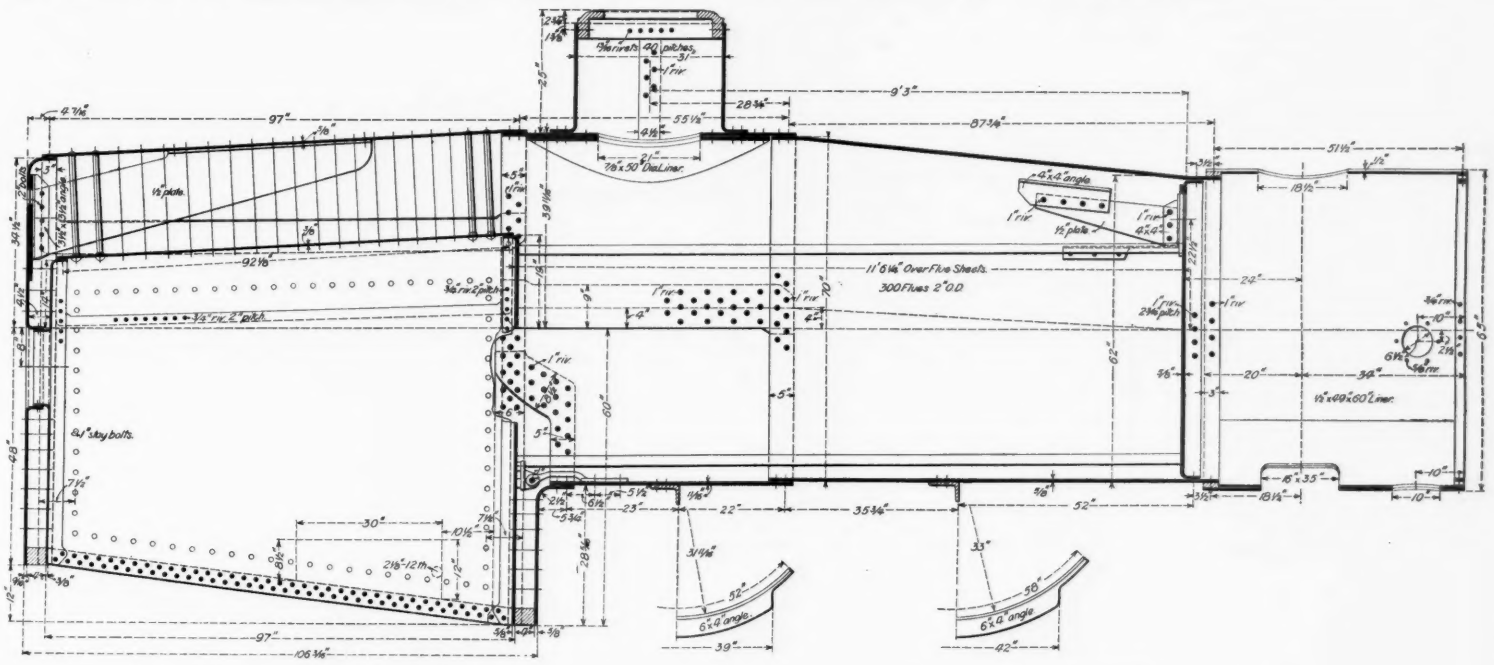


Fig. 3.—Details of Boiler of Brooks Passenger Locomotive—Chicago, Indianapolis & Louisville.

BROOKS LOCOMOTIVES FOR THE "MONON."

Gage	4 ft. 8½ in.
Fuel	Bituminous coal
Weight on drivers	79,000 lbs.
" " truck wheels	42,800 lbs.
" total	121,800 lbs.
" tender loaded	88,000 lbs.

Boiler.

Boiler	Wagon top
" steam pressure	190 lbs.
" material in barrel	Carnegie boiler steel
" thickness of "	⅝ and 11/16 in.
" diameter " "	62 in.
Seams, kind of horizontal	Quintuple riveted
" " circumferential	Double "
Thickness of tube sheets	⅝ in.
" " crownsheet	⅝ in.
Crownsheet stayed with	Radial stays
Dome, diameter	30 in.

Firebox.

Firebox, length	8 ft. 1 in.
" width	3 ft. 5 in.
" depth front	79 in.
" " back	62 in.
" material	Carnegie firebox steel

" thickness of sheets	3/8, 5/16 and 5/8 in
" brick arch?	Yes
" water space, width	Front 4 in , sides 4 in., back 4 in.
Grate, kind of	Cast-iron rocking

Tubes.

Tubes, number	300
" material	Charcoal iron
" outside diameter	2 in.
" length over sheets	11 ft. 7½ in.

Smokebox.

Smokebox, diameter	65 in.
" length	58 in,

Other Parts.

Exhaust nozzle	Single, permanent
" " diameter	4⅝, 4 13/16 and 5 in.
" " distance of tip above center of boiler	6½ in.
Netting	Wire
" size of mesh	3½ × 3½ in.
Stack	Straight
" least diameter	15¾ in.
" greatest diameter	15⅞ in.
" height above smokebox	3 ft. 7½ in.

Tender.

Type	Swivel trucks
Tank capacity for water	4,000 gals.
Coal capacity	8 tons
Material	Tank steel
Thickness of tank sheets	3/16, ¼ and 5/16 in.
Type of under-frame	Wood
" " truck	Diamond
Truck with	Rigid bolster
Type of truck spring	Double elliptic
Diameter of truck wheels	33 in.
" and length of axle journals	4¼ × 8 in.
Distance between centers of journals	5 ft.
Diameter of wheel fit on axle	5⅝ in.
" " center of axle	4¾ in.
Type of truck bolster	I-beam
Length of tender frame over bumpers	22 ft. 3 in.
" " tank	19 ft. 6 in.
Width " "	8 ft. 8 in.
Height " " not including collar	49 in,
" " " over collar	67 in.
Type of back drawhead	Cast-iron
Without	Water scoop

Names of Makers of Special Equipment.

Wheel centers	Pratt & Letchworth
Tires	Midvale
Axles	Cambria Iron & Steel Co.
Sight-feed lubricators	Nathan Mfg. Co.
Bell ringer	Gollmar
Safety valves	Consolidated Safety Valve Co.
Injector	Metropolitan, Hayden & Derby Mfg. Co.
Driver brake equipment	New York Air-Brake Co.
Tender brake equipment	New York Air-Brake Co.
Tender brakebeams	Sterlingworth Railway Supply Co.
Tender brakeshoe	Brooks Locomotive Works.
Air pump	No. 2 New York Air-Brake Co.
Air pump governor	No. 2 New York Air-Brake Co.
Steam gages	Ashcroft Mfg. Co.
Engine truck springs	A. French Spring Co.
Driving springs	A. French Spring Co.
Tender springs	A. French Spring Co.
Piston rod packings	United States Metallic Packing Co.
Valve rod packings	United States Metallic Packing Co.

Eclipse Steel Semaphore with Protected Lenses.

The Eclipse Switch & Signal Co., of Elmira, N. Y., makes a galvanized steel plate pole and semaphore signal which is claimed to be so well protected against moisture that it will last a hundred years, being constructed throughout without making use of any material liable to decay. The base of the post, which is buried in the ground, is made of cast iron. This foundation is placed in concrete. It may first be placed in position and the pole then be raised upon it. A casting fixed inside the base of the galvanized steel plate post is so arranged that the two parts (the one set in the ground, or concrete, and the other bolted inside the base of the pole) may be firmly bolted together. The pole proper is made of steel plate which is formed by machinery into the shape shown and made from 20 to 40 feet long. This plate is galvanized both inside and out, and, being made in two halves, is coated with graphite paint inside as a preservative before the two halves are riveted together. The rivets used in riveting the two halves together are first treated with a coating of tin to prevent rust.

The casing used to protect the lantern is of malleable iron. This supports the semaphore arm as well as the outer lens. This casting may be fitted on the pole at any desired height from the ground, usually 20 to 25 ft. If but one arm is to be used on the post the cap shown on the top in this drawing can be placed over the top of the casing of the middle or lower frame, the top of the post being first removed. The Eclipse lamp is inside the post as shown, and the colored lens is inside the same casing. The glass is held by a light but strong frame or spectacle which is moved by means of a rack and pinion actuated from the spindle of the semaphore arm. The whole is protected by a colorless outer lens, thus providing against any dangerous breakage of glass by violent means.

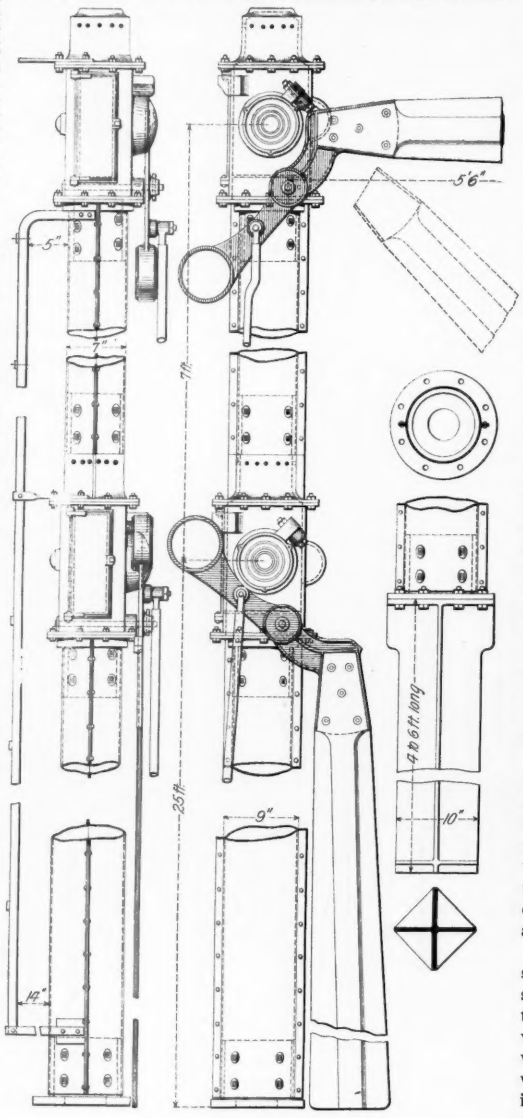
The makers claim that this galvanized steel plate will last 100 years, basing their argument on the fact that ordinary galvanized iron when placed in a vertical or upright position so that water cannot accumulate on the galvanizing, has been found free from rust after many years even when not protected by paint or varnish. To change from a two armed semaphore to a single arm it is not necessary to take down the entire pole, as the top arm and that portion of the pole necessary to support it may be removed and the cap made to cover the casing of the lower.

The malleable casting carrying the colored lens is made in such a shape that it is possible without taking down the signal to add a green glass, so that the signal might be made to indicate, at night, red for danger and green for safety. By removing the red glass and putting in the green the signal is converted into a distant signal.

The connection of the malleable casting carrying the colored lens with that of the semaphore arm is such that it is possible to depress the blade to an angle of about 40 degrees without in any way affecting the colored light. Where the semaphore is some distance from the cabin it is not always possible to get the blade in the horizontal position, owing to contraction or expansion of the different connections; this allows the blade to droop, and with the ordinary fixtures may show a white light underneath the colored lens, thus giving a safety indication when danger should be displayed. By the allowance made in this semaphore a depression of the blade to something like 40 degrees would not at all affect the colored lens; after the blade had passed the 40 degree mark, and between that and a 70 degree angle, the safety indication would appear.

The Eclipse company also makes a double arm train order signal. An aluminum reflector is used which adds greatly to the brilliancy of the light.

The cost of this signal is very little in excess of the ordinary semaphore with wooden post, and the company has put up a considerable number of them, the roads on which they are in use being the Pittsburgh & Western, the Baltimore & Ohio, the Louisville & Nashville, the Norfolk & Western and the Cincinnati, Hamilton & Dayton. This company's semaphores, with wooden posts, are in use on the Pennsylvania Lines West of Pittsburgh and on the Burlington, Cedar Rapids & Northern.



Eclipse Steel Semaphore.

It has also put up signals for the lines of the Plant system and for the New England Railroad.

This company is making a bracket pole which is also composed entirely of malleable iron and galvanized steel.

Suburban Competition.

BY CHARLES J. BATES, M. AM. SOC. C. E.

II.

Though these articles [See *Railroad Gazette*, page 182] were written with a hope of some day seeing a more general application of electricity to trunk lines than to suburban traffic only, it is manifest that the trunk lines must perfect its application to suburban service before they can attempt so great a change on their through trains. Having considered the necessities of the case to meet the competition of the trolley lines, it now becomes desirable to consider the advantages to the railroad company, irrespective of competition.

The Liverpool Overhead Railway in using electricity has discarded the locomotive, and put motive power on each car. They are thus freed from the necessity of duplicating their prime motive power when increasing the number of trains. By getting the tractive use of the weight of the train, they are enabled, and have found it desirable, to run trains more frequently and of any capacity the demands of the traffic require. This could not be done with locomotives without considerably increased expense.

Frequent communication has much to do with the attractiveness of a suburb, by giving to the family and friends, rather than to the commuter himself, facilities for going to and from the city without long waiting. While I cannot give figures, it has been clearly observable, during a long suburban residence, that the settlement along the line bears a marked relation to the number of trains run. If, after any considerable interval additional trains have been put on, the increase in the number of settlers was marked, up to a certain point, when the increase ceases, until again more trains are entered. It was not the increased seating capacity that was needed, for there was room enough on the former trains to accommodate a considerable increase of population, but because trains were at hand at the hours at which people wished to take them. One additional train cannot be put in service on a road where an important consideration is distribution of the men's time, as in case of a line on which a day's work for a crew is four trips (two round trips). If one train is needed it will be necessary to put two trains, each way, on the schedule, or have the crew idle half their time, or what may be worse, to furnish a locomotive earning only half its capacity. With electric traction, without locomotives, in order to increase the number of trains, in many cases it will only be necessary to run some of the cars at a different time—without increase of motive power or expense, out of proportion to the advantage. With electric traction, trains may be run into the terminal and the cars left just where they are for inspection and ready to go out again, or be moved about and rearranged without the expense of the switcher or the room necessary to make flying switches.

For example, the Northern Railroad of New Jersey has a commutation list of about 2,000, the population along its line of 28 miles being about 20,000. The first "express" stop is Englewood, 15 miles. The character of the traffic does not justify running express trains during the middle day or night hours, yet it is a frequent occurrence, that these local trains are loaded with people for Englewood or beyond, whose weight, with the weight of the cars necessary for them, must be stopped and started at every local station, the cost of which may amount to more than the local fares. With a system independent of locomotives, the through passengers could be taken ahead and the local passengers given only such cars as they can fill, and requiring no additional motive power. These remarks apply also to any hour of the day when an unusual number of people demand transportation to some special point, or at an unusual hour, or to the divergence of branch lines from the main at some point distant from the terminus. The popularity of our Saturday half holiday has led the managers of the Northern to run express trains at noon on Saturday, and to save expense and the disturbance of the movements of train crews; they have taken off two of the regular evening trains on that day, but for some weeks in the spring, before that change becomes convenient, the noon local is overloaded with through passengers.

On any line the stations will vary in importance, from an occasional passenger to a traffic that justifies the stopping of express trains, and in some cases the number is so near the dividing line that a just claim may be made for a stop that other considerations of the service render inadmissible. All these difficulties are removed if we have a motive power that can be so subdivided and distributed into units of any size and at any place.

New roads are built to-day and old roads reconstructed to bear the weight of locomotives of increased size. The cost of track maintenance is influenced by the wear due to these great machines. How different will that account be if the track is subjected to the weight of the cars only, slightly increased by the weight of motors? The tractive effort, instead of acting at the four points of contact of the driving wheels, is distributed among all the wheels on the train.

The *Railroad Gazette* says that the reader need not be told that a motor wound for high speed is inefficient for low speed; the same principle applies to the locomotive—an 84-inch wheel would make a poor showing compared with a 60-inch wheel with heavy trains and frequent stops, so considerations of that sort must not discourage the motor.

Some disappointment has been felt, and claims for economy disputed, because the cost and advantage of electric locomotives over steam have not been shown, nor do I believe that any such economy ever will be secured. It is not in the economy of the power, applied to the same machine, in merely a different way, but the possible subdivision of that power into convenient parts, and the facilities that subdivision gives us that will advantage us.

I believe that enough has been done to insure the advantages suggested and to justify railroad companies in placing a system on their suburban lines that will fairly meet working conditions, without interfering with the operations of through travel and its necessary terminal conveniencies. The perfectly feasible characteristics of such a system will be considered later.

Half Year's Production of Pig Iron.

The *Bulletin* of the American Iron and Steel Association has published complete statistics of the production of all kinds of pig iron in the United States in the first half of 1897; also complete statistics of the stocks of pig iron which were on hand and for sale at the close of the half year. With a single exception direct returns have been received from every blast furnace company in this country whose furnace is now active or is likely to be some day active. For the single furnace company from

which no report was received directly a careful estimate of its production during the first six months of this year and of the unsold iron on hand on June 30 has been furnished to us by one of its leading selling agents.

The total production of pig iron in the United States in the first half of 1897 was 4,403,476 gross tons, against 4,976,236 tons in the first half of 1896 and 3,646,891 tons in the second half of 1896. As compared with the first half of 1896 there was a decrease in the first half of 1897 of 572,760 tons, but as compared with the second half of 1896 there was an increase of 756,585 tons.

The production of Bessemer pig iron in the first half of 1897 was 2,495,978 gross tons, against 2,793,672 tons in the first half of 1896 and 1,861,283 tons in the second half. Of the total increase of 756,585 tons of all kinds of pig iron in the first half of 1897 over the last half of 1896, 634,695 tons, or almost six-sevenths, was of Bessemer quality.

The production of spiegeleisen and ferro-manganese in the first half of 1897 was 80,622 gross tons, against 83,010 tons in the first half of 1896 and 48,930 tons in the second half.

North Carolina has produced no pig iron since the first half of 1896; and for the first time for many years Colorado does not appear as a pig iron producer, the three Colorado furnaces having all been idle since September, 1896.

The whole number of furnaces in blast on June 30, 1897, was 146, against 159 on Dec. 31, 1896. The number out of blast on June 30, 1897, was 319. Two new furnaces were being built on June 30, 1897, one in Pennsylvania and one in Ohio.

The statistics of unsold stocks of pig iron on June 30, 1897, show a considerable increase over the unsold stocks on Dec. 31, 1896. On June 30 the stocks which were unsold in the hands of manufacturers or their agents, and which were not intended for their own consumption, amounted to 827,163 gross tons, against 711,649 tons on Dec. 31, an increase of 115,514 tons. These figures do not include pig iron sold and not removed from the furnace bank, nor pig iron manufactured by rolling mill proprietors for their own use.

Included in the stocks of unsold pig iron on hand on June 30 were 75,085 tons in the yards of the American Pig Iron Storage Warrant Company which were yet under the control of the makers, the part in these yards not under their control amounting to 146,515 tons, which added to the 827,163 tons above mentioned makes a total of 973,678 gross tons of pig iron which were on the market at that date, against a similar total of 847,686 tons on Dec. 31, 1896. The total stocks in the above named warrant yards on June 30, 1897, amounted to 221,600 tons, of which almost four-fifths were held in the South.

Freight Locomotives for the Pittsburgh, Bessemer & Lake Erie.

The Pittsburgh Locomotive & Car Works has recently delivered to the Pittsburgh, Bessemer & Lake Erie Railroad three mogul locomotives similar to the one shown by the accompanying illustration. The engine has cylinders 20 in. in diameter by 26 in. stroke, drivers 56 in. in diameter, and a total weight in working order of 149,000 lbs., with 130,000 lbs. on the driving wheels. The boiler is of the radial-stay, straight-top type of ¾-in. steel plates and designed to carry a working steam pressure of 180 lbs. per square inch. The diameter of the barrel is 72 in. There are 2,033.7 sq. ft. of heating surface, of which 161 sq. ft. are in the firebox. The grate area is 28.25 sq. ft. The tender has a capacity of seven tons of bituminous coal and 4,000 gals. of water. The driving and truck axles of the locomotive as well as the piston rods are nickel steel. The driving wheel centers are of steeled cast iron.

For the three engines referred to, the tires were furnished by the Midvale Steel Co., the axles by the Carnegie Steel Co., the lubricators by the Detroit Lubricator Co., the Safety Valves by the Consolidated Safety Valve Co., the standing devices by H. L. Leach, the injectors by Hayden & Derby, the driving brake equipment by the American Brake Co., the tender brake equipment and air pumps by the Westinghouse Air Brake Co., the driver brakeshoes by the Lappin Brake Shoe Co., the steam gages by the Ashcroft Mfg. Co., the engine and tender springs by the A. French Spring Co., and the piston and valve rod packing by C. C. Jerome.

The following table gives the general dimensions:

PITTSBURGH, BESSEMER & LAKE ERIE ENGINES.

Gage	4 ft. 8½ in.
Fuel	Bituminous coal
Weight on drivers	130,000 lbs.
" on truck wheels	19,000 lbs.
" total	149,000 lbs.
" tender loaded	78,300 lbs.

General Dimensions.

Wheel base, total, of engine	22 ft. 5 in.
" " driving	14 ft.
" " total (engine and tender)	50 ft.
Length over all, engine	26 ft. 8¾ in.
" " " total, engine and tender	59 ft. 1¼ in.
Height, center of boiler above rails	8 ft. 5⅝ in.
" of stack above rails	15 ft.
Heating surface, firebox	161 sq. ft.
" " tubes	1,872.7 sq. ft.
" " total	2,033.7 sq. ft.
Grate area	28.25 sq. ft.

Wheels and Journals.

Drivers, diameter	56 in.
" centers	Steeled cast iron
Truck wheels, diameter	(Paige) 33 in.
Journals, driving axle, size	8 × 12 in.
Journals, truck axle, size	5½ × 9 in.
Main crank pin, size	6 × 6 in.

Cylinders.

Cylinders, diameter	20 in.
Piston, stroke	26 in.
" rod, diameter	(Nickel steel) 3½ in.
Kind of piston rod packing	Jerome metallic
Main rod, length center to center	7 ft. 8¾ in.
Steam ports, length	16 in.
" " width	1¼ in.
Exhaust ports, length	16 in.
" " width	2½ in.
Bridge, width	1¼ in.

Valves.

Valves	American balance
" greatest travel	5 in.
" outside lap	¾ in.
" inside lap or clearance	3/32 in.
" lead in full gear	1/10 in.
" "	Variable

Boiler.

Boiler	Straight top
" working steam pressure	180 lbs.
" material in barrel	Carnegie steel
" thickness of material in barrel	¾ in.
" diameter of barrel	72 in.
Seams	Horizontal double welted, quadruple riveted
" circumferential	Double riveted
Thickness of tube sheets	½ in.
" crownsheets	½ in.
Crownsheet	Radial stays, 1⅛ dia.
Dome, diameter	30 in.

Firebox.

Firebox, length	9 ft.
" width	3 ft. 1¾ in.
" depth front	73 in.
" " back	61 in.
" material	Carnegie steel
" thickness of sheets	5/16, 3/8 and ½ in.
" brick arch?	Yes, on studs
" water space, width; front, 4 in.; sides, 4 in.; back, 4 in.	
Grate, kind of cas tiron	R. R. Co. Standard

Tubes.

Tubes, number	300
" material	No. 12 knobbled charcoal iron
" outside diameter	2 in.
" length over sheets	12 ft.

Smokebox.

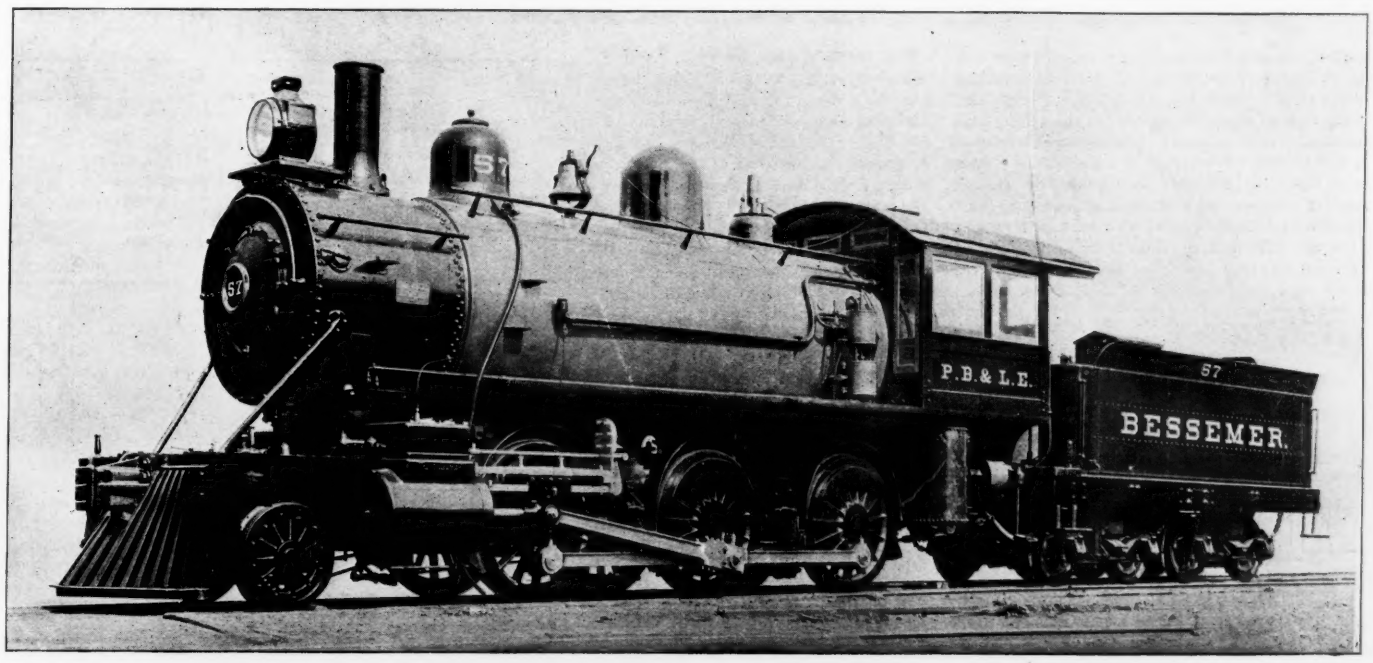
Smokebox, diameter	73 in.
" length	61¾ in.

Other Parts.

Exhaust nozzle	Single
" "	Permanent
" " diameter	4⅛, 4¾, 5 in.
" " distance of tip below center of boiler	4½ in.
Netting	Wire
" size of mesh	2 × 2 in.
Stack	Taper
" least diameter	15 in.
" greatest diameter	16 in.
" height above smokebox	3 ft. 6 in.

Tender.

Type	With swivel trucks
Tank capacity for water	4,000 U. S. gals.
Coal capacity	7 tons
Kind of material in tank	Steel
Thickness of tank sheets	5/16 and ¼ in.
Type of under frame	Wood
Type of truck	Diamond
Truck with	Rigid bolster
Type of truck spring	Double elliptic
Diameter of truck wheels	33 in.
Diameter and length of axle journals	4¼ × 8 "
Distance between centers of journals	75 "
Diameter of wheel fit on axle	5⅝ "
Diameter of center of axle	4⅞ "



Freight Locomotive for the Pittsburgh, Bessemer & Lake Erie Railroad.

Built by the PITTSBURGH, LOCOMOTIVE & CAR WORKS, *Pittsburgh, Pa.*

Estimated Cost of the Boston Elevated.

The Boston Elevated Railway Company has had a hearing by the State Railroad Commissioners on its petition for the right to issue $15,000,000 of stock. George A. Kimball, engineer of the company, presented an estimate of the sums necessary to go ahead with the work. He estimated the cost of the elevated structure at $296,949 per mile. This estimate was for a simple structure and foundations, with 90-lb. rails, without guard rail, and was based on one made by the General Electric Company, an engineer of the General Electric being present and testifying that this portion of the figures was his A contingent item of 10 per cent. is included. The next item in the estimate was 25 stations at $25,000 each. The third was electrical equipment for roadway at $8,400 per mile for a little over 10 miles double track. Other items were: three terminal buildings containing together sufficient storage capacity for all cars, one in Cambridge, two in Boston, $500,000; engineering, five per cent. on all foregoing items; 53 motor cars at $10,000 each, and 144 trailers at $3,000 each; for equipping the subway and adding a third rail, $75,190; for interlocking signals, $107,000; for strengthening the proposed bridge to Cambridge, so that it will carry the elevated structure, $104,000; for three power stations, $1,600,000; land for stations and elevated structure, $1,304,498; eight acres of land for terminals at $75,000 per acre; land for power stations, two acres each, $300,000; abuttors' damages, 9¾ miles, minimum estimate, $3,120,291; maximum, $5,029,768.70. Including the maximum damage, the entire estimate foots up $15,190,056.27. It was stated that the terminal stations were to be two stories in height, with storage for surface cars on the ground level.

W. W. Fifield, of Medford, was the only remonstrant; he thought the sum asked larger than necessary Mayor Quincy, of Boston, and Mayor Sortwell, of Cambridge, joined in advocating the granting of the petition, but the latter thought the commissioners should stipulate that a sum necessary should be set aside to build the Cambridge line. A statement was made that this line would take $5,000,000. The commissioners seemed to be in doubt whether they could authorize the issue of stock with which to build this line until the legislature has authorized the construction of the new bridge over which it must run. Although a strong effort was made to secure the entire sum asked for, there are indications that the petitioners will be well satisfied if they get leave to issue $10,000,000. This would enable them to go ahead with the Boston construction, and to lease the West End road.

On Monday of this week the Commission issued a

long order, in which after saying that in its opinion it is not reasonably requisite within the meaning of the statute now to provide for the cost of construction or other work which depends for its inception on future legislation—meaning of course the Cambridge line—it held it to be reasonably requisite to permit issues of an amount not to exceed $10,000,000 from time to time for construction of the road, equipping, purchasing real and personal property, liquidating damages and defraying the expenses incident to the work. The Board therefore approves the issue of $10,000,000 in 100,000 shares, but upon certain conditions, which are that the original capital stock of the company shall be fixed at that sum, no share to be issued except upon full payment of its par value; that it shall be issued only in such amounts and for such purposes as shall be specified in the orders and votes of the Board; that an issue of $500,000 stock is at once approved, $300,000 for the purpose of making the forfeit deposit with the state treasurer, as provided by statute, and the rest for engineering and other expenses preliminary to construction; that when the routes, locations and plans for the construction, equipment and operation of the lines for not less than six miles have been approved, and all other conditions precedent to construction have been duly complied with, and detailed estimates of the total cost of construction and equipment have been prepared by competent engineers and experts, and the President, Treasurer and a majority of the Board of Directors have certified to the Board that it is intended in good faith to commence at once and to proceed with all practicable dispatch in the work of constructing and equipping said lines, such further issues as shall be requisite shall be approved by supplementary orders.

The Commission also issued an order approving the system to be used on the road, specifying that the cars shall be of the general style but somewhat smaller than those operated by steam power, that the structure shall be light in character, the gage 4 ft. 8½ inches, and the motive power be electricity.

Metal Trucks.

The Shickle, Harrison & Howard Iron Company, St. Louis, is now introducing two styles of metal truck, models of which were shown at the Old Point Comfort conventions.

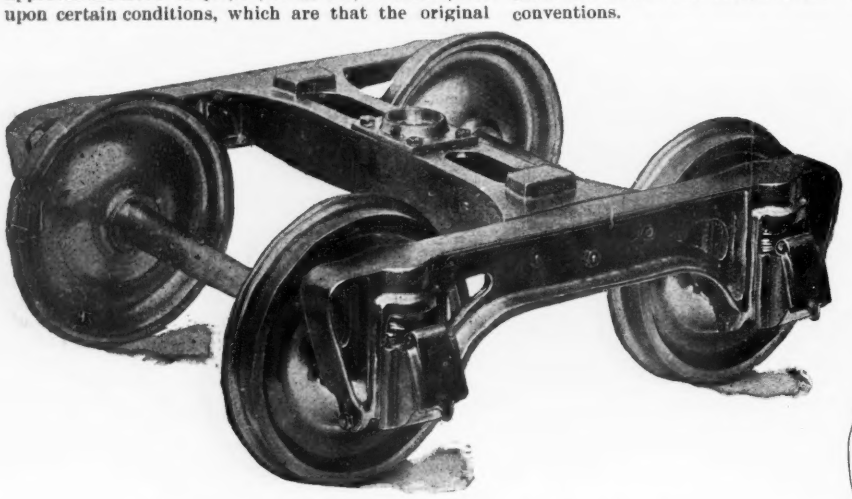
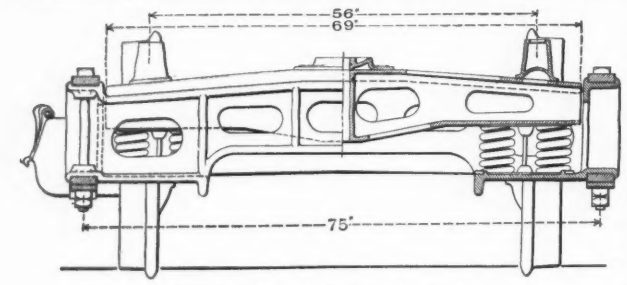


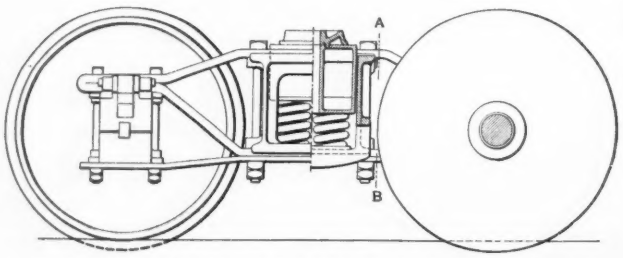
Fig. 3.—Ajax Metal Truck, Shickle, Harrison & Howard Iron Co.

The truck shown by Figs. 1 and 2 is known as the "Player" truck, having been designed and patented by Mr. John Player, Superintendent of Machinery of the Atchison, Topeka & Santa Fe Railway. The "Ajax" truck, Figs. 3 and 4, was designed by the Shickle, Harrison & Howard Iron Company.

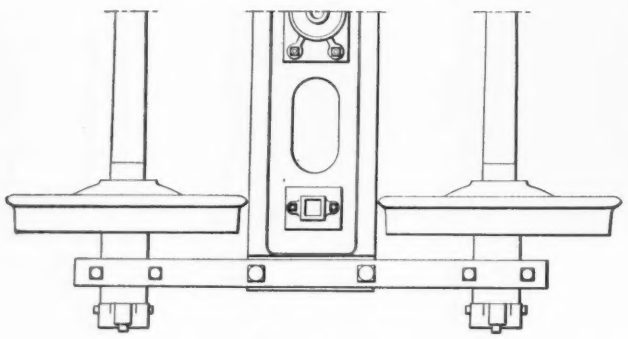
The "Player" truck makes use of the ordinary diamond side frames which are held in alignment by a cast steel transom, which also forms a shelf for the bolster springs, so that the sole duty of the bolster is to carry the load. Where the bolster is depended upon to keep the truck in alignment, to carry the load and also move freely between the column guides there is a tendency to strain the columns and cause them to wear rapidly.



Half Section A B and Half Center Section.



Half Side View and Half Center Section.



Top Plan.

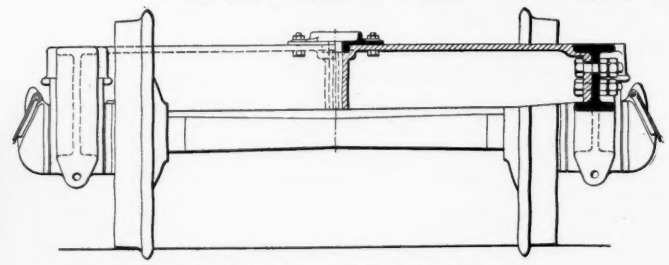
Fig. 2.—Player Metal Truck.

With the "Player" truck since the load is transmitted to the transom near to the points of support the stresses arising in the transom are small, and on account of the short bolster used the stresses in the bolster are reduced and a lighter bolster is consequently used than is common with this type of truck. The bolster not including the center and side bearings weighs 350 lbs. and the transom weighs 550 lbs.

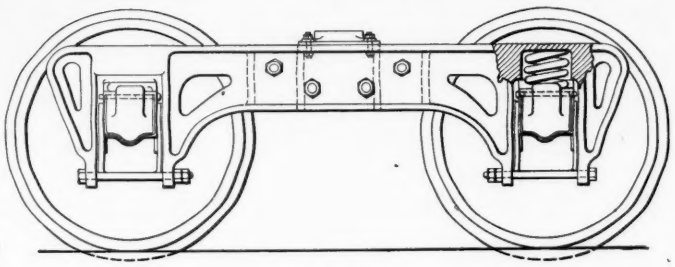
If for any cause it is desired to remove a nest of springs, by carrying the load on a jack the springs can be taken out through the opening provided at the end of the transom.

The Ajax truck, as shown by Figs. 3 and 4, consists practically of three pieces, the transom and two side frames, these being steel costings. The side and center bearings are separate pieces bolted to the transom to permit of an adjustment of these parts. The ends of the transom, as shown, fit into pockets cast in the side frame so that the bolts act merely to hold the parts together, and are relieved of all shearing stresses. Coil springs are centrally located over each journal box, the upper spring seat as well as the pedestal being cast as a part of the side frame.

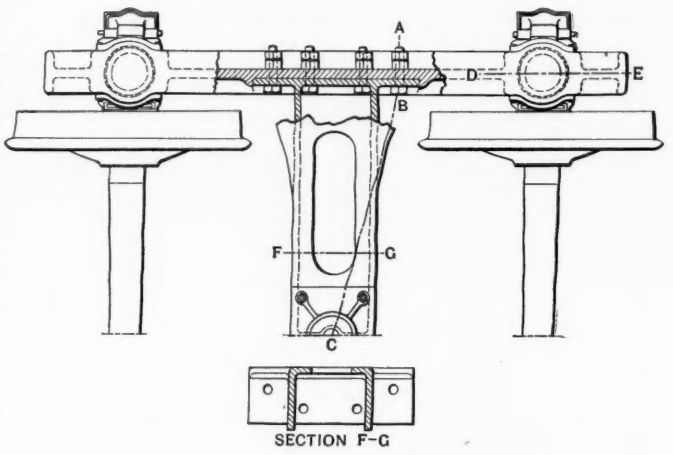
We are advised that the low carbon steel used in the construction of this truck is such that it can be worked in a manner similar to wrought iron, and if the parts should be bent in a wreck they can be heated and easily straightened. Those who are interested in metal trucks and have followed the various designs brought out within the past year will be particularly impressed with the simplicity of the Ajax truck, the small number of parts and the absence of all riveted joints.



Half End View and Half Section A B C.



Side Elevation.



Top View.

Fig. 4.—Ajax Metal Truck.

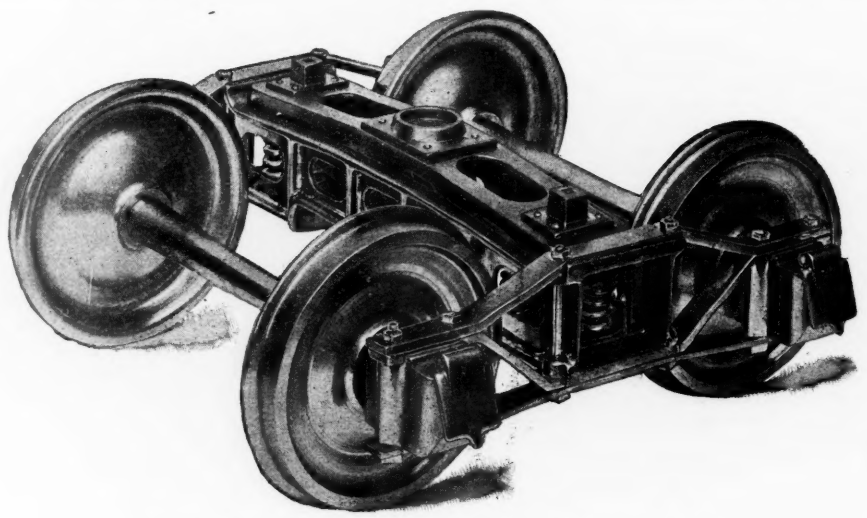


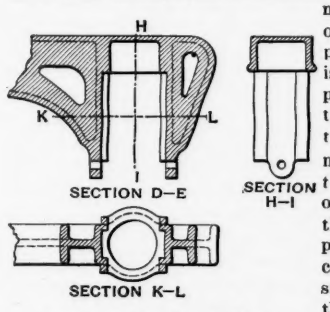
Fig. 1.—Player Metal Truck, Shickle Harrison & Howard Iron Co.

Legislation in Pennsylvania.

During its long session of 6½ months the Pennsylvania Legislature passed comparatively few measures affecting steam or electric railroad corporations. Considerable time was spent devising schemes to raise extra revenue made necessary by the burning of the old capitol and other additional expenses.

One of these revenue raisers, which is expected to bring in about $300,000 annually to the state treasury, increases the bonus on corporation charters from one-quarter to one third of one per cent., and puts a bonus of one-third of one per cent. on increases of capital stock. Heretofore corporations increasing their capital stock have paid no bonus.

Another bill which affects railroads employing foreign workmen on construction work puts a tax of three cents a day on employers of unnaturalized foreign work men over 21 years of age, for each employee. Authority is given to the employer to deduct the amount from the wages of the men. One-half this tax goes to the various counties and the balance to the public schools of the counties. The constitutionality of this measure will be attacked in the courts, suits having already been entered in the Allegheny and Philadelphia courts. It is said that the Allegheny Valley road, sooner than trouble itself collecting this tax, has notified all its unnaturalized foreign laborers that they must quit. One effect of this measure has been to largely increase the business of naturalization courts.



Details of Ajax Metal Truck.

Another bill was that protecting employees of corporations in their right to form, join or belong to labor organizations. This bill imposes a fine or imprisonment, or both, on the person or persons found guilty of coercing those of their employees who are members, or who desire to become members of such organizations.

These bills were also passed: Requiring the bonus confirmation of certain titles of real estate by alien or foreign corporations having conveyed real estate since June 9, 1891, before inquisition held; extending for five years the time for which foreign corporations may add real estate; continuing for five years the time which corporations may add and convey the title to real estate heretofore bought under execution or conveyed to them in satisfaction of debts, and now remaining in their hands unsold; amending the act of April 9, 1870, so that all corporations owning or operating lines of railways, canals, transportation, telegraphs or telephones located in whole or in part in Pennsylvania, shall make detailed sworn reports of their transactions to the Secretary of internal affairs by June 30 of each year.

The big railroads of the state waged a bitter and successful fight against the Young bill giving trolley companies the right of eminent domain, and providing for the assessment of damages by the usual method, the appointment of a board of receivers. This measure failed to pass the house wherein it was introduced. Had it become a law it would have meant a big boom in electric railroad construction, and a corresponding loss of revenue to competing steam lines.

Mr. Robinson on Kansas Rates.

President D. B. Robinson, of the St. Louis & San Francisco, in a letter to the Kansas Board of Railroad Commissioners on the proposition to reduce freight rates, says:

"The St. Louis & San Francisco Railroad Company begs to acknowledge the receipt of your letter of May 28, in which your board makes a statement of certain reductions in freight rates which it deems reasonable. . . . This company admits that the public has a right to demand and require that its service shall be performed by railroad companies for such rates as are reasonable, fair and just.

"If the rates now charged are unfair, unjust or unreasonable, this company would be glad to co-operate with your board in securing a uniform reduction of such rates to that basis, but as its officers are of the opinion that the rates now in force are not unfairly, unjustly or unreasonably high, they cannot, in justice to the owners of the property in their charge, do otherwise than to most respectfully, but at the same time firmly and finally, decline to act upon the suggestion of your honorable board. . . .

"Rates, if too high, must be either unfair, unjust or unreasonable in themselves, or must be so as compared to other sections where similar conditions obtain. As a matter of law, no rate is unreasonable in itself which does not compensate the carrier for the actual cost of the service rendered, including taxes, and at the same time furnish more than a reasonable return for the use of the capital actually and necessarily invested in the enterprise. This statement has the support of common sense, common honesty, and the courts of the land.

"As a matter of fact, the rates in Kansas are not sufficiently high to do this. . . .

"The above recited proposition of law being conceded, the proposition of fact can be established before your honorable board at any time by any road within its jurisdiction.

"This being true, the rates now in effect cannot be held to be either unfairly, unjustly or unreasonably high of themselves.

"It is, however, true that rates which are fair, reasonable, and just of themselves may be unfair, unreasonable, and unjust by reason of discrimination in favor of one community, section or state, and hence we may properly inquire whether the present rates on like traffic in other and neighboring states, where similar conditions as to expense and earnings prevail, and whether the Kansas shipper is thus discriminated against.

"The officers of this company have very carefully examined and compared the rates in force in other states where the conditions are similar to those obtaining in Kansas and as a result of such examination and comparison have come to the conclusion that the rates in Kansas are as low as in any state in the Union, where similar conditions obtain, and in those states where different conditions prevail the rates are fully as high as they are in Kansas, if such difference in conditions be taken into consideration.

"In conclusion, and as a result of a careful canvass of the entire situation, the officers of this company have been driven to the conclusion that the rates now in force in Kansas are not unreasonably high of themselves, nor are they unjustly high as compared with those in force in other states where similar conditions obtain, and, having come to this conclusion, the answer above given to the suggestions of your honorable board is the inevitable result."

Meeting Trolley Competition.

In our issue of June 18 we gave a description, accompanied by a map, showing how a steam and an electric road combined to the advantage of both in order to secure the suburban passenger traffic between St. Louis and some of the towns southwest of the city. The conditions in the northwestern part of St. Louis County also present an interesting study. It will be seen from the accompanying map that Ferguson, about 12 miles from St. Louis, is on the route of the Wabash Railroad. Heretofore, the passenger service has been inadequate and the Suburban Electric Railroad, which operates a line between St. Louis and Florissant, decided to run a branch to Ferguson and thus secure at least a part of the passenger traffic. The Wabash Road, however, realized the situation and has established a rapid suburban service over the tracks shown on the accompanying map. Four trains will run continuously around the circle formed by the Wabash main line, the Terminal Railway and the Ferguson branch of the Wabash road. The circle extends to Ferguson and touches Woodstock, Ingleside and other growing towns. Trains will run every 30 minutes and will pass over the Y at the Union Station, thus avoiding delays in running into the headhouse.

Electric and Steam Roads at St. Louis.

River and Harbor Improvements.

The United States army officers in charge of the river and harbor improvements along the New England coast and in the Delaware River have made their several annual reports, containing statements of the work done in each district during the past fiscal year. Major R. L. Hoxie, in charge of the Portland (Me.) District, reports that $16,982 was spent in dredging the Lubec Channel, and $10,107 in extending the breakwater at Bar Harbor, between Mount Desert and Porcupine Island; considerable dredging was done at Belfast, Camden and Rockland Harbors, Me., and at Little Harbor and in the Bellamy and Cocheco rivers, N. H.; the ledge excavation at Lovejoy Narrows, in the Kennebec River, Me., was finished last November.

Col. S. M. Mansfield, in charge of the improvements to the Boston Harbor reports that the appropriations from 1825 to date have been $3,274,276, of which $2,629,822 has been spent (not including outstanding liabilities). The amount spent during the past year was $100,243. The main 27-ft. channel has been cleared of ledges for a width of 350 ft., and repairs were made to the sea walls at Deer Island, but nothing further of note was done at that point during the year. The channel is now 1,000 ft. wide from its entrance to Bug light, 800 ft. wide thence to the passage between George and Gallaps Islands, and thence 550 ft. wide through the remainder of the narrows.

Major Lockwood reports that $20,194 was spent at Newport in removing "Spindle Rock" and for other work, and that considerable work was done at the Point Judith harbor of refuge.

Major S. S. Leach, in charge of the Connecticut improvements, reports that the jetties at the mouth of the Connecticut River have not been finished, but that the channel has been kept in a satisfactory condition by dredging; the west breakwater at New Haven was extended 1,490 ft., and the project for a 16-ft. channel at that place now lacks only the widening of the Fort Hale cut from 100 to 400 ft.

Major C. W. Raymond, in charge of the work in the Delaware River and Bay, reports that 3,956,027 cu. yds. of material were excavated from the harbor of Philadelphia by the American Dredging Company, and that the filling of League Island was completed by the deposit of 594,776 cu. yds. of material. The channel is now dredged to the full depth of 26 ft. from Morris street to the Pennsylvania Railroad bridge at Fisher's Point, 6.2 miles. On the Cherry Island flats, below Philadelphia, 169,235 cu. yds. of material have been removed by the Morris & Cummings Dredging Company; the same company has a contract for a channel 600 ft. wide and 26 ft. deep at mean low water from a point above Dan Baker's Shoal to deep water below Pea Patch Island, and had removed 756,316 cu. yds. of material under this contract up to June 30. Other work done in this district includes a dike at Fort Mifflin, at the junction of the Schuylkill and Delaware rivers.

Light Railroads for South Africa.

The government of Cape Colony, realizing the need of branch lines, recently appointed a Commission to visit and report upon the Continental and Irish light local railroads, as well as some other small railroads in Europe. The Commission consisted of officials of the Midland system and it reported to a Committee of the Legislative Council appointed to take evidence on the question. The information concerning the work of the Commission which follows is abstracted from *Engineering* (London) of April 30:

The inquiry dealt with the adaptability and suitability of light, normal and narrow-gage railroads to districts in the Cape Colony of a purely agricultural and pastoral character, offering only local traffic, without the addition of mineral or large commercial and passenger traffic—districts that could not afford sufficient traffic to pay working expenses and interest on railroads costing from $20,000 to $30,000 a mile; in other words, districts similar to those traversed by existing branch lines in the colony, none of which pay interest on their cost, and barely their working expenses. The evidence laid before the Commission showed, first, that the average cost of normal gage lines in the Cape Colony had been $45,000 a mile; these could now be built with heavier rails for about half that amount; second, that the Vryburg Mafeking extension through easy country cost $10,000, and the Indwe branch through average country cost between $15,000 and $20,000 a mile exclusive of rolling stock; third, that little railroads in the Cape of 2 ft. 6 in. gage had been built (half through difficult and half through easy country) at an original cost of $7,000 and subsequently reconstructed with heavier rails at a total cost of about $15,000 a mile, and that lines of the 2-ft. gage could be generally built for $10,000 a mile, the equipment and permanent way costing only $2,750 a mile; fourth, that the cost of working such little roads was approximately half that of the normal gage railroads.

On the other hand, it was also shown that by retaining the normal gage and adopting light railroads in lieu of narrow-gage roads, the following advantages could be secured: 1. The ready utilization of surplus second-hand rolling stock and permanent way. 2. The inexpensive provision of increased facilities to meet the requirements of possible future expansion in the character and volume of traffic, as well as the following disadvantages avoided: 1. Entirely new rolling stock and separate repairing shops. 2. Transshipment of freight, and consequent delays in time and increase in expense.

With respect to the gage, however, the consideration which seems most important, independently of the supreme consideration of the existence or not of other gages in the same country, is to choose the one which can deal most economically with the anticipated traffic, that is, convey it with the least train-mileage, and with the trains filled to their greatest carrying capacity.

What would suit the agricultural districts of South Africa would seem to be a narrower gage line than the normal 3 ft. 6 in., say 2 ft. or 2 ft. 6 in., costing not more than $10,000 to $12,500, including rolling stock and roadbed, provided with numerous sidings into every farm, these worked by the farmers with their own cattle, the train service being at most one a day each way, run at a speed of 10 to 15 miles an hour as a maximum, the line having an average length of, say, 50 miles. It should be connected with existing normal lines at one or both ends and start preferably at or near some existing normal locomotive depot. The working arrangements should be freed from state and municipal restrictions and interference and reduced generally to the simplest possible minimum, except at junctions and termini. Two classes only are required, one for natives and one for Europeans. These lines should depend solely upon the existence of requisite local conditions as to population, attractions, products, etc., and above all, local effective support, *i. e.*, an undertaking on the part of producers and consumers to contribute something toward them, and to give them their entire custom. The lines must be assisted by government and by local bodies with a subsidy proportionate to their cost, to be regarded as a first installment toward the eventual purchase of the lines at the end of the concession, with, in some cases, a guarantee of interest. In this way purely agricultural local lines, which are urgently needed, would be provided, and could be made to pay, and the unfortunate experience of existing agricultural branches avoided.

On the whole, the Commission reported in favor (1) of the construction of light railroads of normal Cape gage in all districts where the lines would necessarily form part of the general system of the country, but wherever they would be comparatively isolated, then of any suitable and economical narrow gage 2. Of the construction of such lines by contract rather than by departmental work, and by private companies rather than by government, so as to avoid the undesirable political element unavoidable in the promotion and working of all government undertakings, which seriously handicaps them as compared with private ones. 3. Of reasonable financial assistance being afforded to them in supplementary ways, consequent upon local and independent support.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The receipts of the Lehigh Valley Railroad for tickets sold to employees have amounted, in the last 12 or 15 months, since the regulation was established, to about $15,000, and from the fund produced by the money received from these tickets 15 superannuated employees now receive regular incomes. It will be remembered that some of the employees of the Lehigh Valley, more particularly those in the shops, asked the road to make a low passenger rate for them and their families, believing that such an arrangement would be more satisfactory than to continue the custom of asking for passes. The directors of the road agreed to the proposition and issued tickets at half a cent a mile; and they announced that such portion of the proceeds as might be found necessary would be set apart as a pension fund for the support of employees retired on account of old age. We understand that thus far no part of the fund has been appropriated to any other purpose. An employee, to become a beneficiary of the fund, must have served at least 15 years, and no pension is more than 30 per cent. of the salary received by the employee at the time when he retired from active service. These special tickets are sold at the shops, from which we infer that employees in the train and station service are carried free, as on other roads. A prominent Western road, which has carried employees at half a cent a mile, has raised the rate to one cent, on the ground that lower rate was unremunerative. The wisdom of this change would seem to be somewhat doubtful. The income from employees' tickets must be mostly from rides which would not be taken at all if they cost much, and the number of them is so small that they would add nothing at all to the car mileage; thus this income is clear gain and possibly doubling the rate would actually reduce the gross receipts. At any rate the function of the employees' paid ticket would seem to be the maintenance of approximate equality between employees, rather than to add to the company's revenue.

Further Notes on Electric Railroads.

On another page is a letter from an electrical engineer on the matter of the electric railroad concerning which we wrote July 9, p. 492. We have a high opinion of the knowledge and judgment of our correspondent and therefore are sorry to find that he "cannot agree with our assumptions, or the conclusions reached." On further thought, however, we conclude that we probably agree pretty closely. The apparent difference of opinion is mostly a state of mind, revealing itself in the way of looking at the subject and of speaking about it. Our proposition, broadly stated, was that there has been practically no substitution of electricity for steam on railroads actually built and working (about $\frac{8}{100}$ of one per cent. and most of that experimental); and that up to this time the development of the electric art had not justified such substitution. But we suggested further that advances now in sight warrant the belief that we are on the eve of important conversions of steam roads to electric working. Mr. Paine's main proposition paraphrased and condensed is that certain new traffic might be created and certain old traffic might be kept and increased by a service of small and frequent units for which electricity is actually cheaper and better than steam. Really, there is no conflict in their two proportions. They gradually run together as conditions are modified. Indeed, in the next to the last paragraph of Mr. Paine's letter he says in other words just what we have said, that electricity is not yet adapted to main line working. Probably our position is just about the same.

One class of railroads which Mr. Paine would build for electric traction is light country roads, of thin traffic, "Making more or less use of the highway." Possibly this is just one of the classes of roads for which electricity is *not* adapted. It is the kind of road where the trains must be infrequent, when the load on the central station must be variable and irregular, where the fixed charges of the power and transmission plant must be divided by a small car mileage. These are the conditions under which the use of electric energy is not economical, as we understand the matter. Indeed, it seems probable that before long many of these light electric country lines already built will go through the processes of foreclosure sales and liquidation. But just here the case of the Montpelier installation described by Mr. Paine is full of valuable suggestion. Where the generating station can be made to carry a uniform and reasonably large load, much of our objection disappears.

Under ordinary conditions, we should suppose that such lines of light and slow traffic could be worked much cheaper by well-designed steam motors than by electricity, and indeed it is well within the limits of possibility that compressed-air motors may soon be produced that will do this kind of service well and cheaply. Electricity is now doing such work in many cases not because it is cheap, but because people have been willing to surrender their highways to trolley lines, as they would not have done to steam tramways; and yet they might quite as well have permitted steam working. This last is exactly what has been done on a large scale in Italy where there are at least 2,000 miles of steam tramways laid on the high road and not fenced off from the wagon road. These are mostly in Northern Italy and largely in Lombardy, where freight can be carried on such lines more than 100 miles without break of bulk. On one of these lines (Rome to Tivoli) a grade of 364 feet to the mile is worked by adhesion. These lines are simple and cheap in all their outfit and they give direct communication with farms, gardens and mills. The maximum speed allowed is 15 miles an hour. It is supposed that they may have been built and equipped for $13,000 a mile, average, and they have paid an average dividend on common stock of 3 per cent through long commercial depression.

The other class of railroads which Mr. Paine would have electrified, for the ultimate prosperity of the railroads themselves, is the suburban lines. We quite agree with him as to the importance of this. Indeed, we have long supposed that in this field the heavy electric service must soon find its greatest field. But just how such lines are to be safely equipped and worked and that with reasonable cheapness is precisely what we are trying to find out. There are not many railroads that can set apart two tracks at the city end for electrical working. The Pennsylvania might do so at Philadelphia; the New York, New Haven & Hartford will soon be able to do so at Boston; the Boston & Albany could do so now at Boston; the Illinois Central could do so at Chicago, and probably, on a little thought, we could name still other cases; but for the great mass of the roads the live third rail or the overhead trolley, through their terminal yards, seems impracticable. But an important part of Mr. Paine's plan is to keep the suburban trains out of the terminal stations.

Furthermore, it is easily possible to spend too much in trying to hold suburban traffic. There is not much margin of profit in this traffic. Passengers are carried now for two-thirds of a cent a mile, more or less, and that involves a heavy empty car-mileage because suburban trains are loaded only one way. So while increasing interest account, to hold or add to this traffic, one most, generally speaking, find operating economics to balance the greater fixed charges. Just here many a man has stuck when he came to study the matter for his own railroad, and it is largely to simplify this part of the problem that we have hoped to see some cheaper means of generating power come into successful use, as no doubt it will before long.

Mr. Paine's suggestions as to power transmission and his account of the Salt Lake and Montpelier installations are extremely interesting. The Montpelier plant is of great promise, and will no doubt be the pioneer of a class of installations to be built where power can be developed cheaply. Of course, the electric art is only in its early dawn. We all admit that, and we realize that its advances are liable to be made with a suddenness that will take one's breath away. A year or two from now all the locomotive builders may be running for cover. Up to this moment, however, the locomotive industry has not been affected, and the best we can say is that there are now appearing above the horizon certain lights that suggest the way in which the revolution may come.

The Decision on the New York Anti-Trust Law.

The decision of Judge Chester, of the New York Supreme Court, handed down a couple of weeks ago, holding certain sections of the Anti-Trust law passed by the New York Legislature at its last session unconstitutional, deserves more than a passing notice.

The law in question pronounced as illegal and void any contract or combination whereby a monopoly in the manufacture, production or sale of any article or commodity of common use is or may be created or maintained, or whereby competition in the supply or price of any such article or commodity is or may be restrained, or whereby for the purpose of creating, establishing or maintaining a monopoly within this state, or the manufacturing, production or sale of any such article or commodity, the free pursuit of a lawful business, trade or occupation is or may be restricted or prevented; and the making or attempting to make any such contract or combination is punishable under the law by a fine not exceeding $5,000 or by imprisonment for not longer than one year, or by both fine and imprisonment, in case of natural persons, and in case of corporations by a fine not exceeding $5,000.

It will thus be seen that the law is similar to that passed by Congress in 1890, known as the Sherman law, which was upheld by the United States Supreme Court in the now celebrated case of the Trans-Missouri Freight Association. It was a question in that case whether the Federal law applied to common carriers. This question was decided by Judge Riner in the first instance, and on appeal by the Circuit Court, holding that the law did not apply to common carriers.

In commenting upon these decisions at the time, we pointed out that notwithstanding the decision of these two courts, the language of the act was so comprehensive that we could not doubt it included railroads as well as other corporations.

While doubting the expediency of any such legislation and while regretting the difficulties such laws impose upon the proper management of railroads, we do not think it tends to alleviate the situation, bad as it may be, to so construe a plain law as to prevent its operation. It is better to meet the case squarely and if the law is clear the courts ought to adhere to that plain meaning. This the Supreme Court of the United States did in the Freight Association case, when it held, what was denied in the courts below, that the Sherman Law applied to common carriers as well as to other persons. The debatable ground in the case was whether the contract between the railroads in the Association contravened the law, not whether the law applied to the railroads. The Federal Court in that case might, we think, with entire propriety have held that the contract there under view was not unreasonable, or designed to prevent competition.

But whatever one may think on the subject there can be no doubt now that laws of this general character will be upheld by the courts as constitutional as long as the legislatures see fit to pass them. To the extent, therefore, indicated in the brief synopsis of the New York law that we have given above Judge Chester in upholding the validity of the law followed a line of New York cases which culminated in the Milk Exchange case, and others in the United States Courts, the last of which attracting much public attention was the Freight Association case.

It would, therefore, be a mistake if we were to conclude that Judge Chester found the New York law entirely without support from the Constitution. On the contrary, the substantive portions of the law prohibiting the obnoxious contracts and combinations and prescribing punishment for them are upheld by him as within the legislative power to enact. The remedial portions, or those which prescribe a procedure to enforce the law beyond existing remedies, he considers unauthorized and void.

To explain the effect of his decision, it is necessary to consider the remedial procedure of the law. In

brief it authorizes the Attorney General to bring an action in the name of the people to restrain the doing of any act declared to be illegal, with power to examine witnesses, and when he deems it necessary, before beginning any such action, to present to a judge of the Supreme Court an application in writing for an order directing such witnesses as the Attorney General may require to appear before the judge, or a referee designated in the order, for examination.

If it appears to the satisfaction of the judge that such an order is necessary, then it shall be granted, with or without notice as the judge may determine. The testimony when taken must be subscribed by the witness and certified by the judge or the referee and delivered to the Attorney General at the close of the examination. While the law provides that the testimony so taken shall not be given in evidence against the witness, nor shall any criminal action or proceeding be brought against him on account of the testimony so given, yet no person shall be excused from answering any question that may be put to him, on the ground that it may tend to convict him of the violation of the law.

Acting under this law the Attorney General applied for the appointment of a referee to take the testimony of the presidents of various railroads, including the Delaware & Hudson, the Delaware, Lackawanna & Western, the New York, Ontario & Western, and the Jersey Central. The allegations upon which the application was made were based upon information and belief, to the effect that certain railroads and other corporations entered into a certain alleged illegal contract limiting the production of anthracite coal and that Messrs. Sloan, Olyphant and Fowler had knowledge and information as to such illegal contract. Upon this ex parte application the gentlemen named were required to attend before the referee in Albany, to submit to examination. The railroads concerned moved to set aside the order on notice and upon the motion thus made, argued that the law in question was unconstitutional and therefore the proceedings could not be taken.

Judge Chester overruled the motion, so far as it attacked the constitutionality of that portion of the law which forbade monopolies and prescribing punishment for the breach of law. But that portion which imposes upon the Judges of the Supreme Court the duty to aid the Attorney General in the testimony he finds to be unconstitutional, and accordingly dismisses the proceedings.

In other words Judge Chester was of opinion, first, that by the act in question the legislature had attempted to impose upon the New York judiciary functions that were non-judicial, and, second, that witnesses were required to testify without providing that they should enjoy immunity from punishment for the offenses under examination.

It is one of the bulwarks of our national constitution that no man shall be made to furnish evidence against himself. There was a time in the history of civilization when the contrary view was entertained by the enlightened world generally. But the horrors of the Inquisition turned the tide of sentiment the other way so strongly that a man accused of crime was for a long time not permitted to testify at all. And while this has been generally so relaxed as to allow the accused to testify if he chooses, no presumption is to be indulged against him if he does not so choose.

There have been many laws of an inquisitorial nature passed at various times under various circumstances to invade the right of personal security. The policy of them has been placed upon different grounds. The reasons urged in support of them have been plausible and ingenious, not to say at times forcible and cogent. It has been argued, for instance, that the investigation should be sustained because the welfare of a whole people is far greater than that of an individual, and the presumption of an innocent intendment and a harmless result should be entertained rather than the reverse; that it cannot be assumed that any improper use would be made of the information so acquired, or that information would be obtained which could be improperly used; that if the purpose of the law is good, the only means of carrying it into effect should not be withheld, and that in fine a witness is always protected by the provision, common to this class of legislation, that the testimony so obtained shall not be used against him in any criminal action. To these reasons, whether they be specious or whether it is merely the vogue of the times to consider them so, the courts of our own country have, at the last resort, turned, not a deaf ear, but an unsatisfied one. Those jealous guardians of personal rights under the Constitution, the judges of the United States Supreme Court, have never been so happy and clear in their opinions as when they have come to consider a case of this sort, and one can but feel, in reading their plain, strong, simple, terse and direct language, that they realize that they are touching the very bottom of our fundamental law and are passing judgment upon the happiness as well as the hopes of mankind.

Of all these cases that have been before the Court in recent years, on this subject, perhaps none attracted more attention at the time or may be considered of more authority than the case of Counselman, which was decided in 1892. Mr. Justice Blatchford delivered the opinion of the Court, which was concurred in by all the judges. The case arose under that provision of the Interstate Commerce law which forbade granting rates less than the tariff, or open, rates. The grand jury in Illinois were investigating alleged violations of this provision, and Counselman, a witness summoned before them, refused to say whether he had obtained a rate for the transportation of his grain less than the tariff, or open, rates, on the ground that the answer would criminate him. His refusal being certified to the Court and being still persisted in, he was adjudged in contempt of court and to be punished as a contumacious witness. Under habeas corpus proceedings, Judge Gresham, of the United States Circuit Court, approved his conviction and so he appealed to the Supreme Court.

There it was held that while the Interstate Commerce act provided that the testimony should not be used against the witness, it did not exempt him from prosecution for the offenses thus brought to light, which might be proved against the witness by other means than his own testimony, but discovered through that testimony, so that for all practical purposes the witness would be furnishing evidence against himself. This provision of the act was consequently pronounced void. Congress subsequently amended the act so as to provide that a witness examined under this section should not be liable for the violations under investigation This amendment met the objections made by the Court and obviated them.

Had the New York legislators profited by the discussion in the Counselman case, Judge Chester would not have been called upon to pronounce their work a violation of the very Constitution under which it was done. They made the very same error in substance that Congress had made before them, with less excuse, because it was not a new error. In seeking to extract from the witnesses information showing a crime under the law they failed to provide immunity for the witnesses themselves from punishment for the crime thus discovered. Judge Chester was amply sustained by reason and authority in holding this to be a fatal constitutional defect rendering the procedure unavailable.

But the learned justice had his own special objection to the provision in question, which is interesting and instructive, because in maintaining his position he had to enter upon ground less frequently traveled by the courts and not without its pitfalls. We cannot say that Judge Chester is not right when he holds as void this law for the additional reason that it warrants the Attorney General to use the Court for the purpose of merely getting evidence to determine whether the Attorney General shall bring an action or not. A question of this character, says Judge Chester, is administrative merely, not judicial. It pertains exclusively to the office of the Attorney General, with which the judiciary has nothing to do and no law, he maintains, which confers upon the courts functions not judicial is valid. So far we have no difficulty in agreeing with the judge, but the real question is whether the function conferred by the law is judicial, and upon this question the reasoning of Judge Chester is not entirely convincing.

In 1893 a case somewhat similar arose under that provision of the Interstate Commerce act which authorized the Commission to apply to the Federal Court by petition to order a witness to answer questions which he had refused to answer in an investigation made by the Commission to determine whether the law was being violated. Certain gentlemen had been asked among other things whether certain railroads were owned by the Illinois Steel Company. They refused to answer. The Commission petitioned the Circuit Court to order them to do so. The respondents set up that this provision of the law was unconstitutional and thus the Court had no authority to make such order. This view prevailed in the courts below on the ground that Congress had no power to impose upon the courts the duty of aiding an executive department to discharge its functions. But the Supreme Court held that when Congress conferred upon the Circuit Court power to make an order in the premises after hearing both sides, it conferred a judicial function, and so sustained the provision in question. The decision was somewhat narrowed by the peculiar language of the Federal Constitution, but the mere fact that the order sought for had the effect to aid the Commission in the discharge of its functions, though quite different from those of the Court, was not held to be an imposition of non-judicial functions on the judiciary.

This decision known as the Brimson case must throw a shade of doubt over so much of Judge Chester's opinion as relates to the same subject. It is true the New York law is not so well drawn as the Interstate law, but there is enough to support the contention that the power conferred upon the Court is distinctly judicial, in that it provides for the submission of a controversy to the Court for its decision. That such is the power conferred seems to appear from the very fact that both the Attorney General on one side and the witnesses on the other have had their day in court, have presented to the judge the merits of their respective positions, and having been fully heard, have had their rights passed upon under the procedure authorized by the law in an orderly and accustomed manner.

We shall await with interest the ultimate result of this branch of the case on appeal. The subject is most important, and it will not down. The modern legislative thought seems incessantly grappling with schemes to create or invent economic development. Laws of men sometimes contravene the laws of nature. The struggle is an unequal one, and the cries for succor that the human legislature makes to the human judiciary are more frequent and necessitous as the contest waxes warmer. We need all the light on the subject we can get, for the struggles of the future, if more bitter from the disappointments of the past, can only be moderated by the sense of justice fairly dealt out and good reasons aptly set forth.

The British Board of Trade has issued its fifth report on the matters that have come before the Board under the Railway and Canal Traffic Act of 1888, Sec. 31, which is a law allowing aggrieved shippers of freight to go before the Board with complaints of overcharges. The number of complaints is 305, which is more than three times as many as appeared in any of the previous reports, but the term now reported on appears to be a good deal more than one year. Eighty cases were settled "more or less to the satisfaction of the complainant," 124 seem to have been withdrawn and 85 went against the complainants for various reasons; either the Board refused to act, or decided adversely, or referred the dispute to arbitration, etc. Every case carried to the higher tribunal, the Railway and Canal Commission Court, was decided wholly or partly in favor of the railroad company. The results of the proceedings before the Board of Trade are briefly reported for each case, this list filling over 60 large pages. This blue book also contains a report, by Mr. T. H. W. Pelham, on proceedings under the act of 1894. This is similar in spirit to the other law. It throws upon the railroad company the burden of proof in case of complaint of rates that have been increased since Dec. 31, 1892, and under it complainants unsatisfied by the Board of Trade may go to the Railway and Canal Commissioners. Mr. Pelham's report deals with 1,861 complaints; of these 718 were disposed of without hearing, 46 were sent to the Railway and Canal Commissioners without hearing, and 521 are yet to be heard, the complainants not yet having accepted invitations to appear. Of the remainder, 576, over 200 were settled by Mr. Pelham, nearly 300 are still under consideration by him, and 81 have been sent by him to the Railway and Canal Commissioners. Of the complaints reported on by Mr. Pelham, 60 concerned rates on bricks and tiles, 55 stone, 147 grain and flour, 50 hay and straw, 95 timber and 153 groceries. The great bulk of these complaints were presented through associations, the Lancashire & Cheshire conference, the Mansion House Association, the federation of Grocers' Associations and others. The three bodies named presented 867 complaints. *Herapath's Journal* thinks these roports show that the great readjustment of railroad charges resulting from the Parliamentary limitation of rates five years ago has been carried on with a wonderfully small amount of friction between the railroads and the traders. The reports before us show little or nothing about the merits of the cases dealt with. Mr. Pelham states that the coal dealers' complaints were mostly on account of the abolition (when Parliament made maximum rates) of the practice of carrying 21 hundred weight for a ton; those of the brick shippers were for similar reasons (on account of the abolition of assumed weights); and those of the lumber dealers were because different roads used different bases for estimating weights. Aside from these points little information can be gleaned by the American reader; but we note now, as we have before, the marked advantage of the English law over ours in that it gives the Board of Trade only recommendatory powers. Freedom from the responsibility (real or supposed) of making final adjudications between every complainant and the carrier must materially lighten the labors of the Board of Trade official who makes the investigation, and we should suppose he must be envied by our Interstate Commerce Commissioners, who, interpreting our law as requiring them to act as a judicial body, deem it their duty to refine every decision down

to a point where a court can accept it as a whole by a single stroke of the pen.

Though a chicken thief is often able to refer to 500 witnesses who can swear that they did not see him steal, that kind of evidence is not valued very highly by the courts, and it "doesn't go"; but in suits of greater magnitude negative testimony sometimes has much more weight than it deserves; and it is pleasing to note, therefore, that Mr. Justice Dean, of the Pennsylvania Supreme Court, in a case just reported, administers a suitable rebuke to counsel urging such testimony. It is notorious that in fake actions brought for damages because of injuries received through railroad accidents a horde of witnesses will appear for the plaintiff prepared to testify that they did not hear a bell rung or a whistle blown; did not see a flag wave; in fact can testify that there was no warning whatever. This testimony has many times turned the scale in a doubtful case. The railroad company must depend upon the testimony of two or three employees, and their testimony is, in a measure, discredited as coming from an interested source. The Solons on the jury at once remark, "Why, he is paid $60 a month to testify that way.' But when the disinterested outsider appears, his assurances in the negative form, emphasized by the adroitness of the lawyer, make a great impression on a small mind, and the jurymen forthwith assume that the "bloated monopoly" is trying to crush a worthy citizen by purchased testimony, and that they will interfere in behalf of injured innocence, with the usual intelligent verdict. Judge Dean brings the Supreme Court of Pennsylvania into line with other jurisdictions as regards the abuse of this line of testimony, and holds, in effect, that positive testimony on any given point should always predominate over a mere denial of that which is not within the peculiar knowledge of the witness. It is an elementary rule that where the witnesses are equally credible, and their testimony entitled to equal weight, greater weight and credit should be given to those who swear positively to a fact, than those who swear negatively, or to a mere want of knowledge or recollection. A pithy formula is found in the comparatively recent case of Stitt v. Huidekoper, 17 Wall, 385, decided by the Supreme Court of the United States, where Mr. Justice Miller sanctions the rule that "a witness who testifies to an affirmative is always to be preferred to one who testifies to a negative. Because he who testifies to a negative may have forgotten. It is easy to forget a thing that did happen, but it is hard to remember a thing that never existed." Here we have the gist of Judge Dean's charge in a nutshell. The full text of this decision may be found in 37 Atlantic Reports, 568 (Hess v. W. & W. B.").

The adoption of Brown's discipline on the Atchison, Topeka & Santa Fe, recently announced, calls to mind the fact that suspensions have now been suspended on a good many miles of important railroad, affecting many thousand employees. The spread of this idea does not call for elaborate comment for, like many other beneficial changes in theory or practice, it is, in its carrying out, nothing more than getting back from an abnormal to a normal condition. But the proposition that cannot be denied has yet to be conceived, and we find one man, an officer of the Atchison, who has discovered a weakness in Brown's discipline; it is in the hardship it works on the extra men. Hitherto he has had an ample force of supernumeraries at every division terminal, composed of men who have made a living filling the places of regular men who were suspended. Suspensions being now abolished, these outsiders will have no support and so will get regular jobs somewhere else. That will do for an argument; but we suspect that its author will, on reflection, admit that it is a pretty flimsy one. It is true that a small force of reliable extra men is handy to have around, but if it is worth having it is worth paying for, and there can be no unfairness in a change by which the regular forces of each Atchison division shall be increased a trifle so as to provide the necessary elasticity. No trainmaster is justified in keeping his force so small that every extra train will require men to work too long hours for their health; nor, on the other hand, should he keep it so large that the men do not work a fair number of days every week. There is a reasonable medium, and that is the ideal to aim at. Taking in a part of the supernumeraries is only justice to them and it is not injustice to the older men. It must be more or less demoralizing to have men hanging around the yards living on the hope that some conductor will make a big blunder and lose $100 worth of time.

The West Shore Railroad—or, rather the officers of the New York Central, lessee of the West Shore — have settled with the people of Frankfort, N. Y., who have for several months been pressing their claim against the company for abandoning the repair shops in that town, which were established there when the West Shore road was built and which, by a contract then made, were to be maintained in the town permanently, the citizens having contributed a large sum toward the cost of the land for the shops. Within the last year the force in the shops has been gradually reduced and the work has finally been entirely transferred to other towns. By the terms of the present agreement the railroad company binds itself by a bond of $100,000 to give free of rent, except taxes and insurance, the plant formerly occupied by the shops in the village of Frankfort for the use of manufacturers who may be induced to locate there and use the buildings. The railroad company also agrees to pay the $16,000 bonded indebtedness incurred by the village recently in the erection of a new schoolhouse. Further, it agrees to pay one-third of the $58,000 bonded indebtedness incurred by the village in the construction of water works. This is a total of $35,333, with interest on the bonds as they fall due. This seems to be a wise and fortunate settlement of a hard case.

NEW PUBLICATIONS.

The Mineral Industry, Its Statistics, Technology and Trade in the United States and Other Countries to the End of 1896. Vol. V. Edited by Richard P. Rothwell, Editor of the *Engineering and Mining Journal*, etc., etc. New York and London: The Scientific Publishing Co., 1897; 866 pp., large octavo, very complete index. Price, $5.

The reader is doubtless more or less familiar with the scope of Mr. Rothwell's *Mineral Industry*, this being the fifth annual volume. The aim is to collect, as far as possible, statistics of production, imports, exports and consumption of the various minerals and metals in all the countries of the world, and to give, besides that, descriptions of the best practice in the chief departments of metallurgy and chemical technology. Naturally, this is a difficult task, but it has been carried out from year to year with, so far as we can judge, considerable success. Among the special articles we can mention but few. One of these, which seems thorough and well informed, is "Cement Manufacture in Great Britain," by Messrs. W. Harry Stanger and Bertram Blount. This is an article of 25 pages. A short article, less than four pages, but of considerable interest, is on the "Progress and Profits in the German Chemical Industry in 1895," by Dr. George Lunge, and a longer one (13 pages) is "Progress in Electro Chemistry and Electro Metallurgy in 1896," by Dr. W. Borchers. A special article of interest (13 pages and illustrations) is "Present Practice in Coal Washing in Germany and England," by Richard Cremer, and another one is "Modern Coke Ovens and Their By-Products" (20 pages), by Dr. Lunge. Other articles that deserve mention are "The Manufacture of Basic Iron in Alabama" (18 pages), by William B. Phillips, and "Recent Economies in Iron and Steel Manufacture" (6 pages), by H. G. Graves. Another one is on "Electricity in Mining," by Timothy W. Sprague, an article of 10 pages.

Of course these special articles are only a minor part of the volume, the great mass of it being devoted to statistics and other technical and commercial information with regard to the mineral industry of the world.

The Air-Brake Men's Association.—The Proceedings of the Fourth Annual Convention of the Association of Railroad Air-Brake Men, held at Nashville, Tenn., last April, are received. They make a volume of 240 pages with an index. The reports and discussions at this convention we have treated at more or less length in other issues of the *Railroad Gazette*. Copies of the Proceedings can be had by addressing the Secretary, Mr. P. M. Kilroy, Cotton Belt Line, Pine Bluff, Ark.

Boiler Jackets.*

The committee appointed to investigate and report as to which is the most economical locomotive boiler jacket to use, concluded that common sheet iron or sheet steel, painted, was more economical than planished iron, when the general appearance, first cost and the cost of maintenance were taken into consideration. This conclusion was reached after a careful consideration of the answers received to a letter of inquiry.

A painted steel or sheet-iron jacket will have to be repainted about every six months, although some roads only paint their jackets once in 2½ years. As to the length of time paint will last, a great deal depends upon the kind of paint used, the method of applying it, the character of the service to which the jacket is subjected and the condition of the round houses. The Norfolk & Western considers that a planished iron jacket painted over is not so durable as a sheet iron or steel jacket painted, while the Northern Pacific claims that sheet-iron jackets should be painted twice as often as those of sheet steel.

To the question regarding the color and quality of paint used and the total cost per square foot for painting, 18 replies are given in the report. Black is almost universally used and the total cost varies from 7.7 cents for two coats of black asphaltum to ⅛ cent per square foot for Roger's black locomotive finish. The following is used by the Pennsylvania Lines West of Pittsburgh.

Inside, use one coat of freight car color. Outside, use one coat of surface "A," two coats of Roger's locomotive finish, one coat of engine varnish (passenger engines), color Brunswick green. The cost of labor and material per square foot in cents is as follows: Class "R," 1.54; Class "S," 1.8; Class "O," 160 L. B. S., 2.7; Class "O," 140 L. B. S., 2.77; Class "I," 2.03; Class "M," 2.04; Class "P," 2.26.

It is considered necessary to paint the inside of jackets before applying, to prevent internal rusting and corrosion, especially when fresh wood lagging is used, as the aciduous moisture from the wood rapidly destroys the jacket. The Northern Pacific reports the corrosive action is more noticeable with sheet iron than with steel or planished iron jackets. Mineral paint is commonly used for the inside of jackets.

Locomotive boiler jackets wear out from external abrasion, inside oxidation, careless handling in the repair shop, and from external corrosion due to acid drippings from roundhouse roofs. The life of any jacket depends largely upon the care taken of it. The life of planished iron jackets when used over wood lagging varies from two to twelve years, the average being about ten years, although the Delaware, Lackawanna & Western has Russian iron jackets which have been in service more than twenty years, the jackets being now painted. Where boiler coverings other than wood are used the life of planished iron jackets is increased provided the covering does not contain substances which will cause inside corrosion. The Baldwin Locomotive Works has found that asbestos cement should not be used unless all the corrosive substance it contains is neutralized and the surface of the lagging, after application to the boiler, covered with P. & B. asphalt paint. Magnesia is considered by many a better boiler covering than wood.

The following table gives the cost per square foot o the three jackets considered, as reported by various roads:

COST OF JACKETS PER SQUARE FOOT IN CENTS.

Kind of jacket.	Cost of applying excluding material.			Cost of material.		
	Min.	Max.	Average.	Min.	Max.	Average.
Planished iron....	2.2	8.0	4.06	7.9	13.0	10.21
Sheet iron.....	2.22	7.0	4.08	2.0	9.32	3.64
Sheet steel.....	2.22	10.0	4.20	2.0	5.0	3.61

The thickness of jacket material varies from .022 to .070, .025 decimal gage being the most commonly used.

It is the prevailing opinion that properly painted sheet iron and steel jackets are less seriously affected by acid-laden moisture, which drops from the roofs of roundhouses, than are planished iron jackets on account of the protection of the paint. Acid drippings destroy quickly the surface of planished iron unless the jackets are promptly washed off. Benzoin paste is recommended as a protection for planished iron. The acid also attacks the paint on sheet-iron and steel jackets, but in this case the bare spots can be repainted at a small cost.

The effect of acidl-aden moisture on jackets is largely dependent upon the care taken. If properly cleaned, a planished iron jacket will last a long time, but if the moisture is not removed a well-painted iron or steel jacket will probably give better service.

Opinion seems to be so evenly divided as to the relative effect of asbestos, magnesia and wood lagging on the corrosion of the inside of the jacket that on this point the Committee did not come to any definite conclusion as to the best form of lagging to use. It is quite likely from the replies that any of these laggings if properly applied and cared for will give good service.

* From the report of the Committee of the American Railway Master Mechanics' Association, consisting of Messrs. T. B. Purves, Jr., C. G. Turner, A. E. Mitchell, J. E. Sague and Edward L. Coster.

TECHNICAL.

Manufacturing and Business.

The Berlin Iron Bridge Co., of East Berlin, Conn., has received an order to build a new water tower and tank at Atlanta, Ga., for the United Gas Improvement Co., of Philadelphia.

The McMullen Woven Wire Fence Co. will remove its factory from Chicago to Evanston, Ill., a suburb of Chicago. A building 110 × 600 ft. and one story high will be built.

The Pennsylvania Steel Co., of Steelton, Pa., has opened an office at 413 Western Union Building, Chicago, Ill., in charge of W. H. Stearns, formerly with the Buda Foundry & Mfg. Co.

The George B. Sennett Co., of Youngstown, O., has been incorporated by George B. Sennett, Florence Sennett, Thos. E. Davey, Thos. W. Lloyd and C. D. Hine to make engines, machinery, forgings and castings. A new plant has been built and is about ready for working.

The Case Mfg. Co., of Columbus, O., is building an electrical traveling crane for Pratt & Cady, of Hartford, Conn., and one hand power traveling crane for the Salem, (O.) Wire Nail Co. The company has also recently built two electric traveling cranes with a capacity of 40,000 lbs. each, for C. & G. Cooper, Mt. Vernon, O., one gib crane of 10 tons capacity for the Shilling Foundry Co., of Columbus, O., and one hand power traveling crane for the Damascus Bronze Co., of Pittsburgh.

The Chicago-Cleveland Car Roofing Co. has been formed by a consolidation of the Chicago Car Roofing Co., of Chicago, and the Winslow Roofing Co., of Cleveland, O. Offices will be maintained in both Chicago and Cleveland, with the principal office in the Old Colony Building, Chicago. The officers of the new company are: President, Jules French; Vice-President, J. J. McCarthy; Secretary, N. F. Murray, and General Sales Agent, M. E. Ward.

In our last issue we referred to the leasing of the shops of the Schuylkill Navigation Co. by the Union Car Co., of Depew, N. Y., and the building of a new foundry. The contract for the work has been given to George W. Beard, of Reading, Pa. The Metropolitan Electric Co. will furnish a 100-H. P. motor. The plant, which will be used for making chilled car wheels, will be run under the name of the Reading Car Wheel Co., and is to

be finished by Sept. 10. H. H. Hewitt, of the Union Car Works, is President.

The Newark Weldless Tube Co., of Newark, O., will shortly commence work on two new buildings, one 75 × 200 ft., and the other 30 × 50 ft., the latter to be used as a pickling house.

William Sutton, until recently Scale Inspector for the Southern Pacific, has been appointed Mechanical Superintendent of the Buffalo Scale Co., of Buffalo, N. Y.

The Niles Boiler Co., of Niles, O., has been formed to make boilers and plate sheet and structural iron work. A new plant has been built, and is about ready for working. The officers of the company are: President, R. G. Sykes; Vice-President, John McVey; General Manager, J. H. Orwig; Engineer, E. A. Gilbert, and Superintendent, T. F. Pendleberry.

The Crocker-Wheeler Electric Co., of New York City, has opened an office in the Old Colony Building, Chicago, under the management of C. H. Wilmerding. The company has heretofore been represented in Chicago by Sargent & Lundy.

The Carnegie Steel Co., Ltd., of Pittsburgh, Pa., has placed an order with the Cahall Sales Department, of the same city, for 6,500 H. P. of Cahall boilers for its blast furnaces D and E at the Edgar-Thomson Steel Works. This is the fourth order placed for this kind of boilers by the Carnegie Steel Co., aggregating nearly 15,000 H. P. The Cahall Company is also building 4,000-H. P. boilers for the Shenango Valley Steel Co., of New Castle, and 6,000-H. P. for a new sugar refinery. It has also orders to build over 30,000 H. P. of boilers, including boilers for the Brooklyn Edison Co., the Union Traction Co. of Philadelphia, the Detroit & River St. Claire Electric Ry. Co., the Pittsburgh Plate Glass Co., the Buhl Steel Co., of Sharon, Pa., the North Hudson Ry. Co. and the Hudson Electric Light Co., of Hoboken, N. J.

The Brownell Car Co., makers of street cars, St. Louis, Mo., on July 23 filed a deed of trust for the benefit of creditors. The total liabilitias are understood to be $182,364.59. The deed is in favor of F. W. Thompson as trustee for the creditors and covers all the property of the company.

Iron and Steel.

Reports from the Birmingham district state that sales of finished iron have been large during the past week. Shipments of pig iron from the same district are also reported as heavy.

The Jeanesville (Pa.) Iron Works was incorporated in Pennsylvania, July 26, with a capital of $200,000. The Directors are: J. C. Haydon, President; Vernon H. Rood, A. Bartholomew, T. Milnor Morris and Samuel Garner.

Work was finished last week on a new building for the Baltimore (Md.) Malleable Iron & Steel Co. It is 200 × 80 ft. and two stories high. Part of the ground floor will be used for offices and the rest for making iron castings, two furnaces having been put in place. The upper floor is divided into pattern and storage rooms.

The rolling mill of the Atlantic Iron & Steel Co., at Greenville, Pa., resumed work last week. The finishing department is running full and eight puddling furnaces are in blast. The company has enough orders on hand to keep the mill busy for the next three months.

The Tennessee Coal, Iron & Railway Co. on July 27 blew in No. 3 furnace at Bessemer, making seven now in blast. The Oxmoro furnace of the same company is ready for blast.

With the exception of the plate mill, the entire plant of Jones & Loughlin, Pittsburgh (11 mills) is running double turn. It is expected that a triple turn of eight hours each will be ordered at an early date.

On July 27 the Sloss Iron & Steel Co , of Birmingham, Ala., blew in its No. 2 city furnace, making two now in blast.

The Cincinnati Rolling Mill Co., of Cincinnati, O., will convert its three sheet mills into hot mills for rolling tin plate. An additional sheet mill and two cold mills will also be added to the plant.

The Woodward Iron Co., Woodward, Ala., put its second furnace in blast last week.

The Frank Kneeland Machine Co., of Pittsburgh, has received an order to furnish two 24×40 in. sheet mills and one 24×44 in. cold rolling mill for the Denison Rolling Mill Co. The same company will also furnish two 24×32 in. hot mills, three 22-in. cold mills, two 32-in. double shears and one 36-in. squaring shear with one 34-in. roll lathe for Hamilton & Co.'s new tin mill at West Newton, Pa., and a 24-in. tin mill complete for the Ellwood Tin Plate Co., of Ellwood City, Pa.

The New Castle (Pa.) Tin Mill Co. has elected the following officers: President, George Greer; Vice-President, John Stevenson; Secretary, Charles Greer, and Treasurer, William S. Foltz. The Directors are S. W. Cunningham, Pittsburgh; Edwin Norton, Chicago; James McLean, New York, and George Greer, J. P. G. Cunningham, William S. Foltz and John Stevenson, of New Castle.

The plant of the Linden Steel Co., at Pittsburgh, Pa., has been sold at sheriff sale for $86,000. It was bought by the plaintiffs, H. Sellers McKee and the Pittsburgh Bank for Savings, whose executions against the property amounted to $104,196. The company was placed in the hands of Charles F. Wells, Receiver, several years ago.

At the annual meeting of the Ohio Steel Co., of Youngstown, the former Board of Directors was re-elected. The directors elected officers as follows: President, Henry Wick; Vice-President, J. G. Butler, Jr.; Secretary and Treasurer, W. H. Baldwin. The company has orders enough to keep the plant working for several months.

Tod Furnace, of the Youngstown Iron Co., Youngstown, O., was blown in July 26. It was blown out four months ago, and since that time has been almost entirely rebuilt.

On July 22, the first run of steel by the basic open hearth process was made at the new plant of the Birmingham Rolling Mills, at Birmingham, Ala. The low silicon iron made by the Tennessee Coal, Iron & Railroad Co., was used. The capital stock of the Birmingham Rolling Mill Co. has been increased from $500,000 to $600,000.

Riter & Conley, of Pittsburgh, Pa., have a contract to build a new blast furnace at the foot of Hamburg street, Buffalo, N. Y., near the Buffalo Furnace Co., for the Union Iron Works, a new company. The plans provide for running iron directly from the furnace into a ladle, with a capacity of 60 tons. From the ladle the iron will be poured into smaller ladles, which in turn will be carried by overhead electric cranes to pig beds. The cast houses will be of steel, 310 ft. long. The engine house will contain 1,500 H. P. of Babcock & Wilcox boilers. It is estimated that the new plant and docks will cost $400,000.

New Stations and Shops.

Plans for a new three-story brick and stone power-house, costing $350,000, to be erected at First avenue, East River, Ninety-fifth to Ninety-sixth streets, have been filed in the Department of Buildings, New York City. The structure is to be erected for the Metropolitan Street Railroad Company.

The foundations have been built for the new round-house and shops of the Cleveland, Cincinnati, Chicago & St. Louis, at Urbana, Ill. The improvements at this place have so far cost about $12.000.

Armor Plate.

On July 13 the United States Senate took action on the armor plate paragraph in the General Deficiency Appropriation bill. The Senate Appropriation Committee had reported an amendment authorizing Secretary Long to pay an average price of $425 a ton for the armor plate required for the three new battleships Illinois, Alabama and Wisconsin. A still further amendment, however, was offered by Senator Butler, of North Carolina, reducing the price to $300 a ton, and with this last amendment the bill was passed by the Senate. Following this action, Secretary Long made proposals to both the Carnegie and Bethlehem companies that they furnish armor plates for the three ships at the price decided upon by the Senate, but both companies declined to bid, on the ground that it was not possible for them to make armor of the quality they have been supplying to the government, at that figure. The Carnegie Company, however, has offered to supply the diagonal armor for the three ships at a price to be fixed by the Navy Department. This offer is made that the work on the ships may not be entirely stopped, and it is understood that the Bethlehem Company is willing to make a similar offer.

Separation of Grades in Washington.

The Pennsylvania Railroad Company and the Commissioners of the District of Columbia have agreed upon a scheme for the separation of railroad and street grades in Washington, but the plans will have to be approved by Congress before the work can be begun. Briefly, it is proposed to depress the grade of the Baltimore & Potomac from the mouth of the tunnel to a point where the shops are now situated near New Jersey avenue. From this point to the passenger station the track will elevated to cross over the streets with a station very similar to Broad street station in Philadelphia. The road going south from the station to Long Bridge will be elevated over Seventh street and depressed under all the rest of the streets, coming out at about the same grade over the Long Bridge as it is now.

Decision Affecting Sight Feed Cylinder Lubricators.

On July 6, 1897, the United States Court of Appeals, Sixth Circuit, at Cincinnati, O., in case of Nathan Manufacturing Co. and Warren H. Craig vs. The Michigan Lubricator Co., of Detroit, Mich., Judges Tafft and Lurton, and Sage, District Judge, sitting, decided that the Michigan Lubricator Co 's locomotive sight feed cylinder lubricator does not infringe. The Nathan brought suit for infringement of the Craig patent sight feed cylinder lubricator and the United States Court for the First District of Michigan decided in favor of the Michigan Lubricator Company. The Nathan then appealed, the case being submitted Oct. 13, 1896, and after argument the court delayed opinion until the date above mentioned when decision was again rendered in favor of the Michigan Lubricator Co. with costs. This decision just rendered enables the Michigan company to now enter the field of competition.

The Nicaragua Canal Commission.

The President has sent to the Senate the names of the following gentlemen to compose the new commission to investifiate the Nicaragua Canal project, viz.: Rear-Admiral John G. Walker, U. S. N., retired; Capt. Oberlin M. Carter, Corps of Engineers. U. S. A., and Prof. Louis M. Haupt, of Philadelphia. For some days it had been announced as probable that these would be the appointees. Admiral Walker is an able line officer of the Navy, retired for age, and it was quite apparent to those who were posted that the House bill creating the Commission, which required an engineer officer from the Navy, was modified in the Senate purposely to permit Admiral Walker's appointment. Undoubtedly he is a good officer, but his training has not given him any special fitness to investigate the formidable engineering questions which arise in this project. Moreover his age is a great drawback, as it will be impossible for him to undergo the physical exertion necessary for a thorough examination of the country. Captain Carter was graduated from West Point in the class of 1880 and entered at once into the Corps of Engineers. He is a sound and competent officer and will be a valuable member of the Board. Professor Haupt is also a graduate of the Military Academy, but has been for many years in civil life. He has the same relative position in this Board that Mr. Noble had in the former Board. It would be invidious to make any comparison between the men.

A Steel Dam for the Santa Fe.

The contract for a new steel dam near Seligman, Ariz., has been let by the Atchison, Topeka & Santa Fe to the Wisconsin Bridge Works. Work will be commenced on the dam at once, and it is expected that it will be finished by the latter part of October. This steel dam will be built in a cañon between the two big stone dams which the Santa Fe is now constructing, one at Seligman and the other at Walnut, Ariz. The capacity of the reservoir in connection with the dam will be 2,700,000 gals.

Steel Pipe for Sumatra.

The Pennsylvania Tube Works, of Pittsburgh, Pa., has just shipped to the island of Sumatra 90 miles of 4-in. steel pipe for an oil pipe line. The material was inspected and tested by Mr. William R. Webster, of Philadelphia.

THE SCRAP HEAP.

Notes.

The Toledo & Ohio Central has issued a notice warning connecting lines against counterfeits of the 1,000-mile tickets of that road.

The power-house and other buildings of the New Orleans Street Railroad in New Orleans, La., were burned July 22. Loss, $60,000.

The Louisville & Nashville has followed the example of the Southern and the Nashville, Chattanooga & St. Louis in securing an injunction against the Nashville ticket brokers.

An officer of the New England road tells a reporter at Hartford that the electric cars running over that road between Hartford and New Britain have carried from 20,000 to 25,000 passengers weekly ever since they have been running. This is far beyond what was expected.

The Twenty-third Regiment of the United States Infantry, stationed at Fort Crook (Omaha), desiring to attend the dedication of the monument to General Logan in Chicago last week, and being without funds to pay their transportation, were carried through free by the four principal roads between Omaha and Chicago, the Burlington, the Northwestern, the Rock Island and the Chicago, Milwaukee and St. Paul.

The Grand Trunk has prescribed a new regulation uniform for passenger train men. The uniforms will be the same color as at present, blue, but the coats will all be cut alike, sack shape, with close fitting collar. Brass buttons will be done away with and white metal used. On each lapel of the coat will be the name of the road. Each man will be expected to wear a standup collar and white shirt, with a neat tie.

The new Street Railroad Commission of Massachusetts has quarters in the Commonwealth Building, adjoining the State House, and holds its first regular meeting for organization to-day in the office of the Chairman, Hon. Charles Francis Adams. The board will not commence hearings for some little time, but will first make an investigation, through agents and personally, into the questions relating to taxation of street railroads and permanency of franchises, to see what the roads of the commonwealth are now paying for their franchises. The members feel that there is plenty of statistical material relating to length of lines, value of plants, etc., in the material collected by the Railroad Commission.

Recent heavy rains have done considerable damage to railroads in various sections of the country. Those running through the Mahoning and Shenango valleys have suffered washouts and the loss of bridges. The eastern abutments of two bridges, one at Nebo and the other near Struthers, on the Erie & Ashtabula division of the Pennsylvania, have been carried away. The Shenango River overflowed its bank near Sharon, Pa., and covered the tracks of the Erie & Pittsburgh. Near Huntington, W. Va., wind, rain and hail wrecked the telegraph lines on the Chesapeake & Ohio and the Norfolk & Western. Bridges were also washed out on the Norfolk & Western, near Williamson. Near Sidney, Neb., a washout was reported on the Union Pacific.

"Labor" on the Chicago Drainage Canal.

At the meeting of the Board of Trustees of the Sanitary District, Chicago, June 23, an ordinance was passed which provides that in all future specifications and contracts for work under the direction of the Sanitary District, a clause be inserted that contracts shall be executed in strict accordance with the law, under which the District was organized, making eight hours a legal day's work; also, "that in the employment of labor, contractors shall be required and specifically

agree to give preference to union labor." The ordinance further provides that for violations of the eight-hour law, contractors will have to pay to the Sanitary District $5 per hour for each employee required to work in excess of eight hours per day. All the contracts let by the Sanitary District in the past have contained the provision that eight hours should constitute a legal day's work, and the contractors therefore hired their men by the hour and required them to work 10 or more hours a day. The majority of the Committee on Engineering pointed out in their report that as the power to impose the penalty was entirely within the discretion of the Board, modifications could be made to cover extra work done in cases of emergency. The vote by which this ordinance passed the Board of Trustees stood five to three. The minority of the Committee on Engineering objected strongly to the clause giving preference to union labor, and called attention to the fact that during the past five years, where no discrimination in employment was made, no labor disturbances occurred, that the Channel is being constructed through an almost unsettled district where trade unions are impracticable, and that the action taken by the majority was merely to promote their own political interests.

Alaska Railroads.

The rush for the Klondike goldfields has brought to the surface a number of schemes for road building into the Upper Yukon. One proposed line follows the route usually taken overland by the prospectors. It starts from Chilkat, at the head of Lynn Canal, which is above Juneau and the head of navigation, and continues over the White Pass to the headwaters of the Yukon, which is followed in boats down to the goldfields. This route is proposed by the British-Yukon Mining, Trading & Transportation Co., which was organized in London about two years ago with a capital of £1,000,000. The company has asked the Dominion government to guarantee three per cent. interest on its debentures to the extent of £1,500,000.

By another plan the route would begin at Fort Wrangell, near the mouth of the Stikene River, about 200 miles southeast of Juneau, and would follow up the river by steamer to Telegraph Creek, from which point a railroad would be built northeast to Teslin Lake, about 150 miles. The route would then be continued by water along a series of lakes and rivers to the Yukon.

A third route would start from Missanabie, Ont., a point on the main line of the Canadian Pacific north of Sault Ste. Marie, with a railroad 230 miles north to Moose Factory, on the shore of Hudson Bay. From there the route would be by water northwest 1,300 miles to Chesterfield Inlet, and then west about 200 miles up the inlet to the head of navigation. From there a railroad 200 miles long would connect with the waters of Great Slave Lake. Thence the route, it is claimed, would be by navigable waterway for large boats to the mouth of the Mackenzie River, a distance of 1,300 miles. Then a short railroad of 50 miles would give access to the Porcupine River, a navigable tributary in the Yukon. This route would be open five months in the year, giving transportation by water and land for 5,000 miles. Of course it will not be built for many years.

The Simplon Tunnel.

A conference was held June 23 at Genoa between representatives of the Jura-Simplon Company and the city of Genoa, to arrange for the participation of Genoa in the building of the tunnel. Mr. Daumur, of the Jura-Simplon Company, answered the objections raised, as, for instance, that the continuation of the Rhone Canal would give Marseilles such advantages that the new Alpine tunnel would be useless for Genoa. It was pointed out that the tunnel would put Genoa in communication with industrial centers of the first rank. It is doubtful, however, whether the eloquence of the representatives of the tunnel company convinced the Genoese of the wisdom of joining in the cost of the tunnel.

Chinese Railroads.

Mr. W. W. Rich, Chief Engineer of the Minneapolis, St. Paul & Sault Ste. Marie, has just returned from several months' stay in China, where he has been engaged in making a reconnoissance of the territory on route of the proposed Pekin and Hankow Railroad for the information of the Chinese government. Speaking of his his work, he said: "I was employed simply to make an engineer's report on the proposed line, with an estimate of the probable cost. I traversed the entire country between Pekin and Hankow, but made no survey. The line when completed will be about 700 miles long and will run through a country partly level and partly hilly. It will be difficult of construction, solely on account of the rivers and streams that cut up the entire country."

Railroad Advertising.

The following ruling in regard to advertising mediums has been recommended by the Board of Managers of the Joint Traffic Association:

Whereas, Organized societies, associations, etc., publish or control special issues of periodicals, circulars, etc., and

Whereas, The use of such channels of railroad advertising, whether in the freight or passenger departments, and whether paid for in cash or in transportation, or in part by each, has been, and may be, equivalent to unauthorized reductions of published rates or fares and the undue and preferential control of business; therefore be it

Resolved, That no company party to the Joint Traffic Association shall from and after Aug. 1, 1897, publish or participate in any advertisements in any publications of said character.

Resolved, That after said date advertising shall be confined to regularly published standard newspapers and periodicals of general circulation published at regular intervals. In contracting for advertising in such mediums, and in issuing transportation therefor, it shall be stipulated and agreed that such transportation shall be confined to the *bona fide* proprietors, publishers, editors, officers, employees or attaches of such authorized publications and members of their immediate families.

Resolved, That purchases by railroad companies of the tickets of said societies, clubs, etc., or donations or contributions to such organizations, in any form or to any extent, are irregular, and should be at once discontinued.

New York State Canal Work.

Superintendent of Public Works George W. Aldridge, has called for bids to be received at his office in Albany, N. Y., *until Friday, Aug. 6*, for the following work to be done on the Middle Division of the Erie Canal under the $9,000,000 appropriation fund: For improving the canal from a point 100 ft. west of Greenfield road bridge to a point 100 ft. west of Main street road bridge at New London, 8.45 miles; from the last named point to a point 100 ft. west of Durhamville road bridge No. 63, 8.31 miles; from that point to a point 100 ft. west of New Boston road boidge, 9.04 miles; from a point 100 ft. west of Kirkville road bridge to a point 100 ft. east of Butternut Creek Aqueduct, 5.86 miles; from the last named point to a point 100 ft. east of the Upper Hollow Quoin of lock No. 49, 5.3 miles; from a point 100 ft. west of the Lower Hollow Quoin of Lock No. 51 to a point 100 ft. west of Centerport road bridge, 5.56 miles; from the last named point to a point 100 ft. west of Crane Creek Aqueduct, 5.03 miles; from the last named point to the east line of Wayne County, 6.24 miles; also for raising the towing path of the Oswego Canal from Lock No. 7 to guard Lock No. 3 and work connected therewith, 3.56 miles. The work is to be bid for and let separately, and plans and specifications are now on view at the office of the Superintendent of Public Works, Albany, N. Y.; also at the office of Thomas Wheeler, Assistant Superintendent of Public Works, Syracuse, N. Y., and at the office of R. G. Lay, Assistant Superintendent of Public Works, Rochester, N. Y.

The McMyler Coal-Handling Machine.

The McMyler car-dumping coal-loading machine erected for the Valley Coal Transfer Co., Cleveland, possesses a number of new features and advantages over similar plants of the same style previously erected. One of the most important is the trimming device attached to the chute at the end of the apron. It has a capacity of three tons and is scoop-shaped, either end opening, and thereby trimming to either side of vessel. It is practically automatic and is even more rapid than other parts of the machine. Another feature is the bulkhead in the apron or receiver and the extension of the receiver past the ends of the car, so that the coal at the ends delivers before or at the same time as that in the center of the car. The traps that control the movement of the coal to the bucket for trimming and lowering device are valuable parts. All these additions overcome breakage of coal and also trim the coal in a most satifactory manner. The speed of this style of machine is also increased by the arrangement for handling the cars. Instead of the gravity track, a switch runs from the machine track back of the machine. The cars run from switch to the machine track and then a bump car pushes them into the machine. Another addition to speed is made by the use of chain fastenings, and the manner of placing the car in the cradle. When the car has been raised, dumped and returned to the track it runs out of the machine at the opposite end, and with the arrangement at this dock it goes to the ore piles and is ready for loading. This apparatus will handle some 30 cars an hour when in complete operation.—*Marine Review.*

More Hot Weather Stories.

Newspaper dispatches of July 9 from a little town in Pennsylvania say that a strange phenomenon (or as the reporter spells it, phenomena) occurred there due to the intense heat. "The track and roadbed of a siding of the Cumberland Valley Railroad were moved about 18 in. and the rail bent like a bow. Everything connected with the siding was moved, causing a great cloud of dust to suddenly rise without any apparent cause. An expert railroader stated that the expansion was sufficient to wreck a heavy train." The section foreman reporting on this, says: "The track had only shoved a very little, and I did not think it necessary to report it. An engine or train could have passed over it at any time at 40 miles an hour, and it was fixed up in about 20 minutes. Where the track was shoved out there was no ballast, or it would not have moved." The occurrence was on a siding laid with old rails used for storing empty cars.

Land Grants of Insolvent Railroads.

The Secretary of the Interior has issued instructions to the General Land Office which, in substance, limit the right of bond-aided railroads to patents for lands to those lands sold by the company to bona-fide purchasers prior to the date of default by such companies on the payment of their bonds or interest thereon.

The instructions revoke, and are substitutes for, previous ones issued Nov. 19 and Dec. 11, 1895; June 11 and Dec. 26, 1896, and Jan. 2, Jan. 14 and Feb. 12, 1897. The following companies are designated as having been severally in default at the times stated:

Union Pacific, main line, Omaha, Neb., to Ogden, Utah, Jan. 1, 1897.

Kansas Pacific, now part of the Union Pacific system, Nov. 1, 1895.

Central Branch, Union Pacific, Jan. 1, 1896.

Central Pacific (not including the Western Pacific), Jan. 1, 1896.

Western Pacific, now part of the Central Pacific, Jan. 1, 1897.

Sioux City and Pacific, no default has occurred.

The instructions set out that the granting act contemplated and authorized the disposition by any company of the lands earned by it, but the construction of the road, and the provisions of Section 5 (12 Stat., 492), while extending the lien of the United States, on account of the subsidy bonds, over all the property of the road, including the lands granted, clearly limits any forfeiture which may be declared by the United States by reason of a default in the redemption or payment of such bonds to the lands which at the time of the default remain in the ownership of that company; that is, the lands which have not theretofore been actually sold to purchasers thereof. Continuing, Secretary Bliss quotes another enactment in the same line and defining the original one, and then gives the following specific directions:

"You will, therefore, prepare clear lists for my approval, as a basis for patents to be issued, of all lands granted to and earned by these respective companies where, before the time of default herein named, such lands have been in good faith and for a valuable consideration sold to actual purchasers by the railroad company to which they accrued. In all the instances you will require such proof of sale to bona-fide purchasers as you may deem necessary to clearly demonstrate the character and time of the sale in question, which proof should be attached to and submitted with the lists to which it applies when forwarded for approval.

"The issuance of patents to bond-aided railroads for lands not actually sold to bona fide purchasers before default is hereby suspended. A mortgagee or holder of bonds secured by mortgage will not be considered a purchaser within the meaning of these instructions."

Lake Notes.

An immense volume of iron ore is going down the great lakes, especially from the western end of Superior. In three days recently almost 100,000 tons were shipped from the docks of the Duluth & Iron Range road. In one day 42,000 tons were shipped from Marquette, enough to make a train 9 or 10 miles long.

The largest cargo of ore ever carried on the lakes was taken at Duluth week before last, 6,134 net tons by the schooner Polynesia. This year, contrary to former experiences, the largest loads are carried out of Lake Superior, which was formerly at a 10 to 15 per cent. disadvantage compared with Lake Michigan ports, by reason of lesser drafts, which the completion of the 20-ft. channel has done away with. The largest load of ore ever carried on Lake Michigan was week before last, and amounted to 5,520 net tons, in the Coralia.

The report published from Chicago that the owners of the whaleback steamer Christopher Columbus were to build another and larger vessel is incorrect. They have no such intention. The company will, however, build another dry dock at Superior, to be 500 ft. long, and 90 and 115 ft. wide at bottom and top respectively. It will cost about $300,000 and will be the largest dock on the lakes.

A 1,200-ft. extension of the P. & R. coal dock at Superior is being put in by the Great Northern road. About 4,000,000 ft. of timber will be used in the work.

Four lake shipyards have secured contracts in the past month, remarkable considering the low freights prevailing. The last is the Chicago Shipbuilding Co., which has a contract for the biggest carrier yet planned for the lakes, a schooner to be of the same length as the Polynesia and Amazon, but 2 ft. broader, giving a capacity for not less than 7,000 tons on 17 ft. It is understood that the recent contracts let for barges are for the Rockefeller fleet, for towing behind their steamers, the company having now several more steamers than barges.

Indications for a bumper wheat crop in the Northwest have modified materially the past week, and the crop is not likely to be more than an excellent average. This will give about 70,000,000 bu. for shipment east via Duluth and the lakes, which will be a wonderful benefit to lake interests. Just now freights are very low, ore being taken for August at 50 cents a ton from Duluth to Cleveland, 800 miles.

Passed the North Pole.

Cable dispatches say that a carrier pigeon has been caught somewhere in the north of Norway with this legend stamped on its wing: "North Pole passed 15th." Another dispatch says that a carrier pigeon has been caught somewhere else with a "silver ring on one of its feet and the message 'North Pole 142 W 47° 52° [*sic.*] on its wings.'" There are those who refuse to accept these dispatches as proof that Andrée has actually reached the North Pole; but the wise and courageous gentlemen who supply news to the press associations are not shaken by such skepticism. They remember the derisive incredulity of the older members of the household when a lad brought in a land turtle with "Adam, Year 1" carved on its shell.

Ocean Records.

The Morgan Line steamship El Rio, which arrived in this port July 25, has broken the record from New Orleans to this city, having made the run from bar to bar in 3 days 23 hours and 37 minutes, and from her New Orleans dock to Quarantine in 4 days 6 hours and 14 minutes.

The Canadian Pacific Railway Company's steamer Empress of Japan, which reached Hong Kong July 14, from Vancouver, made the trip to Yokohama, in 11 days, and to Hong Kong, including stops, in 18 days, making an average speed of 17 knots an hour. This is the fastest Trans-Pacific passage on record.

Egyptian Railroad Bridge Building.

Lord Cromer has sent to the Foreign Office a letter recently sent to him by the British Chamber of Commerce in Alexandria, urging the desirability of all government administrations and departments advertising and having specifications prepared in English as well as in the languages hitherto used, as they point out that translations, especially on technical matters, are frequently misleading. Mr. Robertson, the newly appointed President of the Railway Board, suggests that the issue of specifications in French, the language generally used, should be no real hindrance to English firms, for "there must be hundreds of men in London who can translate such papers," and he adds that at least one technological dictionary gives every technical word in all trades in English, French and German. English manufacturers have been repeatedly told that their adherence to our system of weights, measures and money is a hindrance to their foreign trade; but there is a special reason why in the matter of bridge-building English firms are at a disadvantage, for the continental and American bridge-building firms supply designs as well as the work, while English firms build to the designs furnished to them, and they send in only a general sketch with weights, as a rule, much in excess of those in the most carefully studied projects. The strike clause, now so common in English tenders, is a hindrance where time is an object. On the subject of prices, Lord Cromer mentions that the tender from an English firm for the Embabeh bridge was £138,000, while an Italian firm put in a tender at £67,340. A French firm obtained the contract for £81,200; and, although the bridge broke down and has to be strengthened at a cost of £33,000, the total cost to the Egytian government will be nearly £24,000 less than the English offer. In another case, where the designs were prepared by the Egyptian government, ten firms competed, the English tender being £16,619, while the others ranged from £9,600 to £5,807, the two lowest tenders being from Belgian firms. Without any pretense to speak with authority, Lord Cromer suggests that there must be some mean between the cheap and apparently too flimsy construction of some continental bridge-builders and the very expensive solidity of the English bridges, and the suggestion is well worthy of consideration by those who are engaged in the business.—*The Economist.*

The Copiapo Railway.

The annual report of the Copiapo Railway of Chili for the year 1896, has recently been issued. The first half of the year the earnings fell below the corresponding period in 1895. In the second half, however, there was a considerable improvement, due to the advance in the price of copper in the European markets, which reacted favorably on the copper industry in the territory reached by this road. The gross earnings for the year 1896 were $660,092, as against $577,822 in 1895; the operating expenses were $476,821 in 1896 and $419,493 in 1895, making an increase in net earnings in 1896 of $24,942. During the past year the net profits were 4.36 per cent. of the capital stock. The increase in gross earnings was almost entirely due to freight, there being an increase in up freights of $96,672, against a decrease in down freights of $16,766. The increase in the expenses was apportioned as follows: General, $8,511; working, $3,849; maintenance and renewals, $44,968. New rolling stock and machinery bought during the year amounted to $13,195. The number of passengers carried during the year was 60,963, against 59,588 in 1895, and the amount of freight carried was 841,362 metric quintals (82,806 long tons). The Copiapo Railway extends from Caldera, on the coast of Chili, in a general westerly direction through Copiapo, Paipote and Pabellon, to San Antonio, 151 km. (93.7 miles), with two branches, one from Pabellon to Chanarcillo, 42 kilometers, and the other from Paipote to Puquios, 50 km. The road is standard gage.

Employees' Fares.

General Manager Frey, of the Atchison, Topeka & Santa Fe, has given notice to employees that on and after July 20 employees' rate of fare will be advanced from one-half cent to one cent a mile. The circular states that this arrangement does not affect the practice of issuing free transportation to employees and their families on account of long and meritorious service and in recognition of faithfulness and efficiency.

Brown Discipline on the Atchison.

The Atchison, Topeka & Santa Fe will make the Brown system of discipline effective on the Atchison road proper Aug. 1.

Assessments in North Carolina.

The North Carolina Railroad Commission last week, in reassessing the property of the railroads in that state for taxation, increased the valuation of the total amount of property owned by the roads over $3,000,000. This was not due to any unusual or extensive amount of new railroad construction, but almost entirely to the fact that railroad as well as other kinds of property in that state has never been assessed for near its true value, the assertion now being made that railroad property is assessed under the new rate at from 50 to 66 per cent. of its real value.

LOCOMOTIVE BUILDING.

The Baldwin Locomotive Works has received an order to build two passenger and four freight engines for the Chicago, Milwaukee & St. Paul. They will be of the Vauclain compound type.

Mr. S. Hasegawa and Mr. S. Awaya, two mechanical engineers connected with the locomotive department of the Nippon Railway Co., of Japan, are in this country. We understand that the company is in the market for some new locomotives and that these gentlemen are attending to certain details in connection with the same, but that no orders will be placed until the arrival in this country of Mr. J. Y. Mori, the Vice-President of the road, who is expected here within the next two weeks.

The Baldwin Locomotive Works has received an order from the Imperial Government Railways of Japan for 20 mogul locomotives with 48 in. driving wheels and tenders of 2,600 gals. capacity, to haul a load of 336,000 lbs. up a grade of 1 in 40, combined with 15 chain curves at a speed of 18 miles per hour. The engines are to have automatic vacuum brakes, copper fireboxes and brass flues. The following builders were invited to bid: Baldwin Locomotive Works, Brooks Locomotive Works, Cooke Locomotive & Machine Co., Pittsburgh Locomotive & Car Works, Rogers Locomotive & Machine Co., and Schenectady Locomotive Works.

CAR BUILDING.

The Louisville & Nashville has placed an order with the Elliot Car Co., of Gadsden, Ala., for 450 box cars.

The Canada Atlantic has placed an order with the Pullman Palace Car Co. for 500 box cars. They will be equipped with Trojan couplers.

The Jackson & Sharp Co., of Wilmington, Del., is building 25 passenger cars of American design for the Waterloo & City underground railroad, of London.

The Texas & Pacific has placed an order with the Missouri Car & Foundry Co. for 300 freight cars. Two hundred of these are box cars and will be equipped with the St. Louis flush car door furnished by the Western Railway Equipment Co., of St. Louis, Mo.

The 150 box cars which the Mt. Vernon Car Mfg. Co. is building for the International & Great Northern will be equipped with Westinghouse air-brakes, Standard couplers, Mt. Vernon Car Mfg. Co. wheels, St. Louis single-track flush door and malleable draft lug and follower made by the Western Railway Equipment Co., of St. Louis, Mo., Pickering springs, Garratt & Co. brasses and Flatau roofs.

BRIDGE BUILDING.

Binghamton, N. Y.—The contract for superstructure of the Ferry street bridge, bids for which were received July 12, has been given to the Oswego Bridge Co., at $27,745, and the contract for the steel work of the De Forest steel bridge has been awarded to the Elmira Bridge Co., at $15,740. The contract for the substructures for both bridges has been given to the Groton Bridge Mfg. Co.

Chicago, Ill.—Bids are asked until Sept. 8 for building four bridge substructures along the main drainage channel. The work includes the building of a center pier and two wing abutments for each bridge. Thomas Kelly, President Sanitary District, Security Building.

Conneautville, Pa.—The storm of last week swept away the bridges over Foster Creek, at Gothic and Mulberry streets. They will be rebuilt by the borough.

Montreal, Que.—The Dominion government will build a new steel swing bridge across the Lachine Canal at Seigneurs street. A larger and heavier structure will be built in place of the one now in use A similar bridge at Atwater avenue is also being considered by the government.

Mount Morris, N. Y.—At special town meetings held in this town and Leicester July 13 both towns voted to build a new iron bridge below the dam.

Smethport, Pa.—The County Commissioners have given the contract for a 100-ft. iron bridge to the Massillon Bridge Co., at $1,200.

Stroudsburg, Pa.—Last week's storm swept away five county bridges in Jackson Township and Shafer's bridge in Stroud Township. They will all be rebuilt.

West Braddock, Pa.—The Homestead & Highlands and the Homestead & Braddock Electric Railroads will open their new bridge over the Monongahela River on July 31. The bridge consists of about 1,100 ft. of viaduct on the Braddock side, followed by one span, each 252, 517 and 489 ft. long all through, double track, with 6-ft. sidewalk. Wilkins & Davison, Pittsburgh, are the engineers for the bridge.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulations of Railroads.

In Pennsylvania it is laid down that under a statute giving railroad companies the right to "connect their roads with roads of a similar character" on terms agreed on by the companies, and in case of their failure to agree, providing for appointment of a jury can determine only matters relating solely to the physical connection of the roads, and cannot order transferred to the petitioning road lands, water or privileges.[1]

In Pennsylvania a conveyance of land described as bordering on a certain street, while effecting a dedication, for the purposes of a street, of the strip described as a street, as between the parties, is subject to a prior grant of a right of way over such strip, and a prior appropriation of part of its width for the building of a lateral railroad.[2]

In New York implied authority to a railroad company to operate a turntable does not authorize its operation in such a manner as to constitute a private nuisance.[3]

In town upon an application to the railroad commissioners for an order requiring a railroad to construct an undergrade crossing in addition to a causeway connecting the two parts of applicant's farm, on the ground that it was inconvenient and inadequate, in that the owner was obliged to open and close gates each time he drove his stock to water, it appeared that in all other respects it was or could be made adequate. The Supreme Court holds that an order requiring the railroad company to construct such undergrade crossing was unreasonable.[4]

In the Federal Court a reorganization agreement provided for the refunding of securities, and also that a branch road, which was not remunerative, should be sold, the proceeds to be applied as the committee appointed to carry out the reorganization might determine. The branch was excepted from the new consolidated mortgage executed under the agreement, but was not sold, owing to the failure of the reorganization because of the non-assessment of certain bondholders. The Court holds that the assenting bodholders did not waive their lien on the branch in favor of those dissenting.[5]

In the same court it is ruled that an order made by the Court, adopting a schedule of wages to be paid by the Receivers, is not violated by the Receivers, in respect to employees receiving monthly wages by varying the train service to meet changing conditions of traffic, though such change requires somewhat longer hours of service and more miles of service; it appearing that the total service required is not unreasonable in itself, or by comparison with the service on other lines.[6]

Injuries to Passengers, Employees and Strangers.

In Kentucky it is ruled that a railroad has the right to make and enforce reasonable regulations for the running of its trains, and a passenger who boards a train which is not scheduled to stop at the station to which he has purchased a ticket cannot recover damages because of a refusal of the conductor to stop the train at such station.[7]

In Minnesota it is held that where a mileage book provided that it was to be used only by the person to whom it was issued, "whose signature appears on the last page," and that it was "subject to the conditions named in the contract, and made a part hereof," one of which was that it was not transferable, and that it might be taken up if presented by any other than the original holder, "whose signature is hereon," the fact that the original purchaser never signed the book did not render it assignable.[8]

In this case it was further decreed that where a passenger was not entitled to ride on a ticket presented for his fare, the fact that the conductor wrongfully took up the ticket did not justify the passenger in refusing to pay fare except on condition that the ticket be returned.[9]

In Oklahoma it is ruled that the fact that plaintiff asked the ticket agent when a certain train was due, and received a reply, and then purchased a ticket for L., an intermediate station, at which said train was not scheduled to stop, did not require the company to stop the train at that station to permit plaintiff to alight, on the ground either that the agent led plaintiff to believe that the train stopped there, or that there was an implied agreement to stop.[10]

In Minnesota it is held that a railroad was not negligent in permitting an ordinary freight car, on which plaintiff voluntarily took passage, to stand 30 minutes in the yards at a way station for the purpose of discharging freight, after 40 minutes had been consumed in arriving at the station, without providing means of safe egress for passengers who might be required to leave the car by calls of nature.[11]

In Kansas, the Supreme Court rules that a railroad is liable for an injury received by a passenger because of the starting of a train before she had alighted, though the train stopped the usual length of time at the station, and the passenger was prevented from getting off within that time solely because of another passenger's unnecessarily stopping in front of her.[12]

In Illinois it is held that the concurrent facts of the happening of an accident to a passenger on a street car and the exercise by the passenger of ordinary care do not raise a presumption of negligence against the carrier, so as to shift the burden of proof on it to show that it was not guilty of negligence, where plaintiff's evidence shows that the accident was due to a wagon driven so close to an open car as to strike plaintiff's foot.[13]

In Kansas where coal is piled from 2 to 3 ft. high on top of the tender, and also on the flanges of the tender, it is negligence, rendering the company liable for injuries caused by the coal falling on an employee working by the side of the track as the tender passed.[14]

In Texas it is held that allegations that plaintiff was repairing defendant's railroad; that he stood 6 ft. aside to avoid an approaching train; that while it was in rapid motion the fireman negligently jumped from the locomotive, and broke plaintiff's leg by striking against him—do not state a cause of action.[15]

In Kansas the Supreme Court decides that where a push car was carried by the employees of a railroad company a safe distance from the track, and there blocked in the ordinary way, and afterward third persons, not connected with the company, attempted to put it on the track, and, being interrupted, ran away, leaving it dangerously near the track, the company was not responsible for the resulting collision between the car and a locomotive.[16]

In Texas it is decided that a railroad is not liable for the death of a switchman employed in its yards, who was killed while coupling cars, by reason of one of the cars being out of repair, where it was a part of the duty of switchmen in such yards to handle cars out of repair, and the car in question had been marked, in accordance with a rule of the company, by a card showing it to be in bad order, which fact was also known to the deceased before he attempted to make the coupling.[17]

In New York it is held that a laborer employed by a street railroad company, when returning home after a day's work, free of charge, on one of the company's cars, is not a fellow-servant of the conductor, so as to preclude recovery for injuries received by falling through a gate on the car, left unsecured by the conductor's negligence.

In Pennsylvania it is held that negligence in failing to give a signal at a railroad crossing, resulting in the killing of a person on the crossing, cannot be deemed the proximate cause of the injury resulting from the body being thrown against one standing on a station platform 50 ft. from the crossing.[19]

In Indiana no recovery can be had for the death of a brakeman caught between cars while coupling, by reason of defective aprons, which projected from the cars so as to leave but an inch of space between them after a coupling was made, it appearing that there was nothing to prevent deceased from seeing the aprons, and that his attention had been expressly directed to them, and to the necessity of keeping out from between them.[20]

In Kansas it is ruled that where a switch stand has on its top an arrow 17 in. long, which, when turned toward the track, is so close as to knock trainmen from the ladder on the side of the car while performing their duties, the fact that a brakeman injured in that manner has seen and handled the switch does not show him guilty of contributory negligence as a matter of law.[21]

In Indiana it is held that a railroad is not negligent in failing to notify the regular train of a "wild" train, or to have a rule requiring such notice; all trainmen being furnished with time cards of regular trains, on which is a rule requiring wild trains to keep out of the way, and off the time of regular trains.[22]

In Massachusetts it is decided that on the issue of a freight train conductor's negligence in switching his train into the yard, rules designed to regulate the responsibilities and conduct of engineers, conductors and brakemen in the management of trains out upon the road, and not in employer's freight yards, are not competent evidence.[23]

[1] A. & P. v. B. C., 35 Atl. Rep., 734.
[2] Nally v. Penn., 35 Atl. Rep., 638.
[3] Garvey v. L. I., 41 N. Y. S., 397.
[4] State v. B. C. R. & N., 68 N. W. Rep., 819.
[5] Mowry v. F. L. & T. Co., 76 Fed. Rep., 38.
[6] Dexter v. U. P., 75 Fed. Rep., 947.
[7] L. & N. v. Miles, 37 S. W. Rep., 483.
[8] Rahilly v. St. P. & D., 68 N. W. Rep., 853.
[9] Rahilly v. St. P. & D., 68 N. W. Rep., 853.
[10] Noble v. A., T. & S. F., 46 Pac. Rep., 483.
[11] Schilling v. W. & St. P., 68 N. W. Rep., 1083.
[12] Luse v. U. P., 46 Pac. Rep., 768.
[13] Chicago C. R. v. Rood, 45 N. E. Rep., 238.
[14] Croll v. A., T. & S. F., 46 Pac. Rep., 972.
[15] Jackson v. G., H. & S. A., 37 S. W. Rep., 786.
[16] A., T. & S. F. v. Slattery, 46 Pac. Rep., 941.
[17] G., C. & S. F. v. Mayo, 37 S. W. Rep., 659.
[19] Pendergast v. U. R., 41 N. Y. S., 927.
[20] Wood v. Penn. Co., 35 Atl. Rep., 699.
[21] C. & E. v. Wagner, 45 N. E. Rep., 76.
[22] South. K. Ry. Co. v. Michaels, 46 Pac. Rep., 933.
[23] T. H. & I. v. Becker, 45 N. E. Rep., 96.
[23] Caron v. B. & A., 41 N. E. Rep., 1085.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago St. Paul, Minneapolis & Omaha, semi-annual, preferred, 3½ per cent., payable Aug. 20.

Illinois Central, semi-annual, 2½ per cent., payable Sept. 1.

Lake Erie & Western, quarterly, preferred, 1¼ per cent., payable Aug. 14.

Rome, Watertown & Ogdensburg, 1¼ per cent., payable Aug. 16.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Kansas City, Pittsburgh & Gulf, to vote on increase of stock, Kansas City, Sept. 9.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Society of Railroad Superintendents* will hold its next meeting at Nashville, Tenn., beginning Sept. 22.

The *American Street Railway Association* will hold its sixteenth annual convention in Convention Hall, Niagara Falls, Oct. 19–22, 1897.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 25 East Eighth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago.

The *St. Louis Railway Club* holds its regular meeting on the second Friday of each month, at 3 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building Chicago, is secretary.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

Boiler Manufacturers' Association.

The American Boiler Manufacturers' Association of the United States and Canada will hold its ninth annual convention at the house of the Engineers' Club, 1122 Girard street, Philadelphia, Pa., Aug. 3, 4 and 5.

Superintendents of Bridges and Buildings.

The seventh annual convention of the Association of Railway Superintendents of Bridges and Buildings will be held at the Brown Palace Hotel, Denver, Col., beginning Oct. 19 next. Besides the regular and miscellaneous business, the reports of committees and the discussions of the same, excursions have been arranged for visiting the smelting plants in the vicinity of Denver, and also for viewing the scenery. Glenwood Springs, Colorado Springs, Pike's Peak and other interesting places will be visited.

Civil Engineers' Club of Cleveland.

A meeting of the Civil Engineers' Club of Cleveland was held July 13. Mr. Wm. E. Reed presented a paper on the "40-Inch Equatorial of the Yerkes Observatory," which was a very complete description of the great telescope and the observatory in which it is mounted. The paper is illustrated by half-tones from photographs taken during the erection of the structure. An interesting discussion followed in which Dr. Dayton C. Miller, W. R. Warner and others took part.

On motion it was voted to adjourn to the September meeting.

The New England Roadmasters' Association.

The fifteenth annual convention of the New England Roadmasters' Association will be held at the Revere House, Boston, Mass., Aug. 18 and 19, at which the following questions will be taken up for discussion: What is the cost of renewing sleepers from the time received on the section until the last tie is removed and cleaned up? What is the best form of dressing double and single track in gravel ballast? Rail joints: experience with new devices; the mechanical, scientific and practical points in favor of same. Track tools. In which month shall the least or greatest amount of labor be used in the maintenance of track to get the most value from the yearly total cash allowance per section or mile of track, substantiated by facts from past experience? The association will provide a room for exhibition purposes, for the use of which a nominal charge will be made.

Central Association of Railroad Officers.

This Association, a federation of the superintendents' societies of Columbus, Cincinnati, Indianapolis and other cities, held its annual meeting at Detroit, July 20 and 21. Various reports and papers were read and discussed. On the second day of the meeting the members present made a tour of inspection of the terminal facilities of the various railroads entering Detroit. They also made a short trip to Mt. Clemens and back on the invitation the Rapid Railway. The ladies accompanying the party were entertained by pleasure drives in and about the city. The following officers were elected: President, F. T. Whittelsey, General Superintendent, Toledo & Ohio Central; First Vice-President, J. D. Bessler, General Superintendent, Chicago, Burlington & Quincy Railroad; Second Vice-President, H. S. Mitchell, Division Superintendent, Kansas City, Fort Scott & Memphis; Secretary and Treasurer, O. G. Fetter, Cincinnati Car Service Association. Executive Committee, D. S. Sutherland, Division Superintendent, Michigan Central; R. B. Turner, General Superintendent, Cincinnati, Hamilton & Dayton; F. L. Tompkins, Superintendent, Peoria & Pekin Union.

Traveling Engineers' Association.

The Traveling Engineers' Association will hold its annual meeting at the Chicago Beach Hotel, Chicago, Ill., Sept. 14, next. The eighth subject for discussion at the meeting will be, "The duties of engine and trainmen in testing air-brake equipment while on the road," and answers to the following questions are asked: 1. What duties are requisite on engines before leaving round house? 2. When coupling engine to train, should handle of engineer's valve be placed in a certain position, and why? 3. After train is charged to pressure allowed, what may be observed by still operating handle of engineer's brake valve? 4. Why should train test of brakes never be made at reduced pressure? 5. What may a careful observation of air gage show while reducing train pipe pressure during brake test? 6. If cars are taken into or set out of train en route, what duties should require before starting? 7. Should engineers be required to observe air gage while coupling trains after they have been cut? 8. While making brake test is it essential that engineer should observe length of train pipe exhaust, and why? 9. Should it be required at all times to carry excess pressure? 10. Before making terminal brake test, should trainmen be required to examine hose coupling, angle and cut-out cocks, and pressure retaining valves? 11. After brakes have been applied should trainmen be required to examine piston travel, and also whether brakes leak off on account of leaks or defective piston packing? 12. Should it not be necessary for trainmen to examine if hand brakes are partially applied? 13. Should it not be required of trainmen to always notify engineer if any brakes are cut out before leaving terminal or while en route? 14. Would it not be well for trainmen generally on all roads to become more efficient when blowing air whistle signals from rear end of trains while making brake tests? 15. Please give information when tests are made that are out of the ordinary line? The Committee of Arrangements is R. D. Davis, Chairman; W. O. Thompson, Secretary; F. D. Fenn, J. S. Seery, Jas. Fitzmorris, S. W. McMunn. The committee is endeavoring to provide a fund for the entertainment of the members and their families.

Western Society of Engineers.

A meeting of the Western Society of Engineers was held Wednesday evening July 21, in the society rooms, Monadnock Block, Chicago. Mr. Isham Randolph, Chairman of the Entertainment Committee, reported that he had made inquiry and obtained rates for an excursion of the society to Niagara Falls and Toronto, Canada. It was decided to refer the matter to the members by circular letter.

Mr. F. G. Gasche, M. E., read a paper entitled "Causes of Variable Efficiency of Steam Boilers and Their Influence on Tests." The paper was based on an extensive series of fuel tests which the author had conducted at the Illinois Steel Works, Chicago, and at the plant of the Armour Packing Co., at Kansas City. It was claimed that the common practice of drawing the fires at the beginning and the end of boiler tests introduces errors which effect directly the figures obtained for the evaporative value of the fuel and that more accurate results are got by using a "flying start." It was also pointed out that to obtain consistent results the *rates* at which water is delivered to the boiler and coal to the grates must be maintained constant. Where fuel tests are conducted a sufficient number of tests should always be made where the rate of combustion varies, other conditions remaining constant. From these a curve can be constructed which will represent the true value of the fuel, from which curve can be determined the conditions under which the boiler should be worked to give the maximum economy; also, that isolated tests of different fuels at different rates of combustion do not give values from which correct comparisons can be made. As the conclusions reached by Mr. Gasche are the result of an extensive study of this subject and as the paper contains fairly complete data in regard to the tests referred to, it will likely prove interesting to many engineers.

The date of the next meeting is not fixed, but the papers which will be presented are as follows: "The Motocycle," by a committee consisting of Messrs. H. C. Brinckerhoff, L. L. Summers and B. J. Arnold: "Internal Hydrostatic Pressure in Masonry, with Special Reference to Masonry Dams," by Messrs. H. H. Ross and A. E. Broenniman

The *Journal* of the Western Society of Engineers has just been issued, and contains the following: "Railway Ties in India," by Mr. C. F. Street; "The Britts Landing Cable Hoist and Quarry," by Mr. R. D. Seymour, with discussions by Messrs. W. H. Baldwin and T. T. Johnston: "Rope Transmission," by Mr. Staunton B. Peck, of the Link Belt Machinery Co.: "Concrete Water Power Dam at Rock Island Arsenal, Ill," by Lieut. O. C. Horney, U. S. Ordnance. In addition to the above papers which have been presented before the society, the volume contains abstracts of current publications.

PERSONAL.

—Mr. J. L. Neeley has been made Secretary of the Florida Railroad Commission.

—Mr. Frank W. Evatt, General Passenger Agent of the Quincy, Omaha & Kansas City, has resigned.

—Mr. J. A. Jordan, Hannibal, Mo., has been appointed General Manager of the Green Bay & Western, to succeed Mr. S. W. Champion.

—Mr. W. T. Musick has been appointed Car Building Passenger Agent of the International & Great Western, with headquarters at Palestine, Tex.

—Mr. William Doherty has been appointed Traveling Freight and Passenger Agent of the Houston, East & West Texas, with headquarters at Houston, Tex.

—Mr. J. Shively, formerly with the Traders Dispatch Fast Freight Line, succeeds Mr. Joseph Werne as Contracting Freight Agent for the Kanawha Dispatch.

—Mr. C. W. Gibson, formerly Soliciting Cotton Agent of the Mobile & Ohio, has been appointed General Agent of that road, with headquarters at West Point, Miss.

—Mr. T. O. Hearn has been appointed Roadmaster of the Chicago, Indianapolis & Louisville between Lafayette and Chicago, to succeed Mr. M. McConahay.

—Mr. Thomas L. Greene, Manager of the new Audit Company, of New York, has gone to Europe on the company's business, and will probably be gone two or three months.

—Mr. W. A. Bissell, for several years Assistant Freight Traffic Manager of the Atchison, Topeka & Santa Fe, has had his jurisdiction extended over the Santa Fe Pacific.

—Mr. J. O. Rice has been elected Auditor and Treasurer of the Mexico & Acapulco Construction Co., which is building a part of the Mexico, Cuernavaca & Pacific. Mr. Rice succeeds Mr. A. H. Woods, deceased.

—Mr. G. M. Chapman, for several years Accountant of the Chattanooga Southern, has been made Auditor of that road in place of Mr. J. T. Slatter, who is now advanced to the position of General Traffic Manager.

—Mr. W. L. Terry, formerly Trainmaster on the St. Louis & Western, has been appointed to a similar position on the Kansas City, Pittsburgh & Gulf, with jurisdiction extending from Texarkana to Menda, Ark.

—Mr. John W. Tate, Commercial Agent for the St. Louis Southwestern, has been appointed General Agent for the Chicago Great Western, with headquarters at Dallas, Tex., to succeed Mr. H. W. Downey, resigned.

—Mr. William O. Wood has been appointed Trainmaster of the Illinois Central at Walter Valley and Canton, Miss. He was formerly Chief Clerk to Assistant General Superintendent M. Gilleas of that road at Memphis, Tenn.

—Mr. C. L. McKinley, formerly Agent for the Chicago, St. Paul, Minneapolis & Omaha, at Mitchell, S. Dak., has been appointed to succeed Mr. W. R. Van Valen as General Agent of that road, with headquarters at Sioux City, Ia.

—Mr. Frederick S. Harris, for the past four years General Superintendent of the Omaha Bridge & Terminal, has resigned to engage in other business. For the present the duties will be perfomed by Mr. John R. Webster, Assistant General Manager and Secretary.

—Mr. Samuel F. Canby, Manager of the Vancouver, Klickitat & Yakima Railroad, at Vancouver, Wash., was drowned on July 26 from the steamer Mascotte, which was about to sail for Portland, Ore. Mr. Canby was about 55 years old. He surveyed the route of the Baltimore & Ohio through Delaware. In recent years he has been connected with railroads in the West.

—The death is announced of Col. John B. Anderson, a prominent citizen of Central Texas. He was for a number of years General Superintendent of the Louisville, New Albany & Chicago, and in 1859 was General Superintendent of the Pittsburgh, Fort Wayne & Chicago. At the beginning of the war he was made Superintendent of Transportation of the Louisville & Nashville, and had charge of the military railroads in his department.

—Mr. K. E. Hilgard, Engineer of Bridges of the Northern Pacific, with headquarters at St. Paul, Minn., has resigned and will make a long trip through Europe to study bridge building, the use of steel in railroad rolling stock, and hydraulic power plants in connection with long-distance transmission of power. On his return to this country Mr. Hilgard will open an office as consulting engineer, making a specialty of the above-mentioned subjects.

—Major Irving A. Stearns, of Wilkes-Barre, Pa., who has heretofore been Superintendent of the Susquehanna Coal Company, has been elected President of the Delaware, Susquehanna & Schuylkill, to succeed Mr. Alfred Walter, recently elected President of the Lehigh Valley, and will have charge of the great coal properties of Coxe Bros. & Co. Major Stearns, who is a graduate of the Rensselaer Polytechnic Institute, has for more than 20 years been located at Wilkes-Barre.

—There are at present in this country three representatives of the Nippon Railway Co. of Japan, Mr. S. Hasegawa, M. E., Mr. S. Awaya, M. E., Engineer of the Locomotive Department, and J. Sakuroi, Manager of Stores. Mr. Hasegawa is at present in Philadelphia, and will come to New York within the next two weeks to welcome Mr. J. Y. Mori, Vice-President, and Mr. Y. Kunisawa, Manager of Maintenance of Road of the same road, who are now in England. Mr. Awaya will leave New York for Europe Aug. 4. Mr. Sakuroi is in Chicago.

—Mr. D. W. Caldwell, President of the Lake Shore & Michigan Southern, died at his home in Cleveland on the afternoon of July 21. Mr. Caldwell was born in Massachusetts in 1830. In 1852 he became a clerk on the Pennsylvania Railroad; in 1855 he was made Superintendent of the Pittsburgh & Connellsville Railroad, and then advanced through various superintendencies until 1874, when he became General Manager of the Pittsburgh, Cincinnati & St. Louis and other roads in the Pennsylvania system, and from 1881 to 1882 was General Manager of the Pennsylvania Lines West of Pittsburgh. He then became Vice-President of the New York, Chicago & St. Louis, and in 1887 was made President. September, 1894, he succeeded John Newell as President of the Lake Shore & Michigan Southern. Mr. Caldwell was a man of great and unquestioned ability as a railroad officer. He was prompt and resolute, and had a capacious intellect. A railroad officer who knew him well and closely writes to us: "Above all the men I ever came in contact with Mr. Caldwell had a power of condensed expression. It is said that he once remarked that 'if you find it impossible to write what you have to say on one page you had better send a telegram.' I do not think he sent many telegrams himself, and yet his short letters were startling in their absolute clearness and comprehensiveness. Admirable as this quality was it is subject to criticism and leads to the idea expressed in your letter (brusqueness and almost arrogance) when carried into oral communications. I believe that most of the criticisms of his seemingly brusque and arbitrary treatment of subordinates grew out of his ability to entirely cover the question under discussion in a sentence and his disposition to drop a subject when he had in fact finished it.

"I think all the people who knew him well enough to understand him thoroughly admired and liked him, and I know that he had an active, and what might fairly be called a tender interest in anybody who had ever worked for him and deserved his interest. At any rate, in that respect I am voicing the feeling of a host of men he left behind him on the Pennsylvania Lines West of Pittsburgh, and, knowing a good many of the Lake Shore men, I know that is the feeling they had toward him.

"There was another quality that distinguished Mr. Caldwell's administration, and that was his absolute indifference to the methods through which results were obtained. I do not mean to say that he underrated the benefits growing out of the standardization of materials, but I do mean that he had a thoroughgoing contempt for standardization of methods so far as they tended to dwarf the development of men or prompt and vigorous administration."

ELECTIONS AND APPOINTMENTS.

Bennington & Rutland.—At the annual meeting of stockholders, held at Rutland, Vt., July 20, the following Board of Directors was re-elected: Percival W. Clement, Wallace C. Clement, Rutland; George H. Ball, Edgar Harding, Boston; Charles A. Walker, David Willcox, Chester Griswold, New York; John W. Stewart, Middlebury, Vt. Percival W. Clement was re-elected President and Horace G. Young Vice-President.

Delaware, Susquehanna & Schuylkill.—Irving A. Stearns has been elected President to succeed Alfred Walter, resigned to take service with another company.

Kansas City, Omaha & Gulf.—The officers and Directors of this road, notice of whose incorporation was given in these columns last week, are as follows: President, W. P. Hardwick; Vice President, J. W. Pickett; Secretary, J. B. Tucker; Treasurer, L. S. Skelton. Directors: W. P. Hardwick, J. W. Pickett, J. B. Tucker, L. S. Skelton, J. W. Beatty, E. L. Peckham, J. L. Waite, W. R. Duvall, J. W. Randall, B. M. Anderson, George R. Willett, all of Blackwell, Okla.

Little Falls & Dolgeville.—At the annual meeting, held at Dolgeville, N. Y., July 21, the following Directors were chosen: Carl Amann, Titus Sheard, Alfred Dolge, E. R. Wanckel, W. C. Milligan, J. S. Barnett, J. J. Gilbert, E. A. Brown, Ernest Polscher, Edward Dedicke, Karl Fink and Theodore Roth. At a subsequent meeting of the Directors the old officers were re-elected.

Nelson & Ft. Sheppard.—At the annual meeting of stockholders and directors, held at Victoria, B. C., July 14, the following officers and directors were elected: President, D. C. Corbin, Spokane, Wash.; Vice-President, C. T. Dupont, Victoria; Secretary and Treasurer, Austin Corbin, Spokane. Directors, D. C. Corbin, J. H. Adams, E. L. Roberts, C. T. Dupont and A. Corbin.

Norfolk, Willoughby Spit & Old Point.—At the annual meeting of stockholders, held at Norfolk, Va., July 23, the following officers and directors were elected: President, H. L. Page; Vice-President, I. A. Page; Secretary and Treasurer, C. E. Norton. Directors: C. H. Barrett, H. L. Page, E. A. Page, I. A. Page and C. E. Norton.

Northern of New Jersey.—Following the recent acquisition of this road by the Erie, these officers and Directors were elected at a meeting held July 21: President, E. B. Thomas; Vice-President, George M. Cumming; Secretary, J. A. Middleton; Directors, E. B. Thomas, G. M. Cumming, J. G. McCullough, Charles Paine, A. Donaldson, A. S. Hewitt, C. H. Coster, J. W. Griggs and H. G. Marquand.

Northern Pacific.—K. E. Hilgard, Engineer of Bridges, with headquarters at St. Paul, Minn., having resigned, that office has been abolished and all new bridge work will hereafter be done under the direct supervision of Chief Engineer E. H. McHenry.

Oregon Short Line.—An order went into effect July 25 creating a new division of this line by separation from what has been known as the Idaho Division. The new division includes that portion of the line from Ogden to Cameron, Pocatello to Silver Bow and the Cache Valley. It will be known as the Montana Division. C. A. Boies, formerly Assistant Superintendent of the old division, is appointed Superintendent, with headquarters at Pocatello, Idaho. E. C. Manson is appointed Chief Dispatcher and Division Operator, with headquarters at Pocatello. The roadmasters are: H. Shuffleberger, with headquarters at Pocatello, and M. D. Rice, with headquarters at Lima, Mont. Mr. H. E. Van Housen continues as Division Superintendent of the new Idaho Division.

Tennessee Central.—At a meeting of the directors, held at Nashville, Tenn., July 20, the following additional directors were elected: W. C. Chapman, J. Clifford Richardson and Estell McHenry, all of St. Louis. W. C. Chapman was elected Vice-President.

West Clarion.—The Directors of this company, a notice of whose incorporation appears in another column, are: Joseph Bailey, Brockwayville, Pa., President; John A. Middleton and James A. Gardiner, New York; O. C. Benscoter, Brookville, Pa; J. H. Beadle, Dagus Mines, Pa.

RAILROAD CONSTRUCTION,

Incorporations, Surveys, Etc.

Atchison, Topeka & Santa Fe.—A letter from one of the officials of this company informs us that there is no truth in the newspaper reports that the company is to rebuild its track between East Atchison and Rushville, Mo., as noted in this column last week.

Cheat River.—It is reported that a second survey is being made on this line. The proposed route begins at Point Merion, Pa., on the Baltimore & Ohio, and runs up the Cheat River, 73 miles southeast, to Parsons, W. Va., a point on the West Virginia & Pittsburgh.

Chicago, Indianapolis & Louisville.—The work of reducing the grade on the Indianapolis Division from 56 ft. to 26 ft. to the mile, for a distance of three miles at Rensselaer, Ind., has been completed and four curves at Lowell are now being taken out. About 30 miles of new rails are being distributed between Monon and Chicago.

Chicago, St. Paul, Minneapolis & Omaha.—This company has completed an important piece of new track between Spooner and Superior Junction, Wis., on the line running north toward Duluth, at a total cost of $100,000. The new track is 4¼ miles long, and reduces the maximum grade from 60 ft. to 25 ft. to the mile and slightly shortens the distance.

Coast Railway of Nova Scotia.—This road has been completed from Yarmouth to Argyle, N. S., and track is being laid toward East Pubnico. This section of the road is expected to be ready for operation by Sept. 1. The line, when completed, is projected to extend from Yarmouth around the southern end of the peninsula to Lockport.

Galveston, Houston & Henderson.—This company has made application to the City Council of Galveston for a franchise to build and operate an extension of the road in Mechanic street from Thirty-seventh to Twenty-fifth streets. This road extends from Houston to Galveston, and has contracts to handle business of the International & Great Northern and the Missouri, Kansas & Texas.

Great Northern.—A force of men is at work on the Fosston Branch of this road preparing to ballast it from Fosston to Crookston, Minn. The branch as projected is to extend from Crookston east through Fosston and Deer River to Duluth. W. H. Knowlton, C. E., is in charge of the work.

Hot Springs Terminal.—This company has been incorporated at Arkansas with a capital stock of $100,000, to build and operate railroad terminals in and near Hot Springs, Garland County, Ark. The incorporators are: J. P. Mellard, E. W. Rector, E. A. Douglas, W. H. Barry and C. H. Weaver.

Kansas City & Westport Belt.—This company, the notice of whose incorporation was given in these columns last week, is the successor of the Kansas City & Southeastern, a road built about 13 years ago. The present company proposes to put in new ties, bridges, etc., with the purpose of operating it as an extension of the Kansas City, Osceola & Southern from Dodson, northwest about eight miles to Westport, Mo. The track work is being done by the Kansas City, Osceola & Southern. The contract for renewing the bridges was let to J. P. Seawell, and the work is nearly completed.

Lake Erie & Western.—A letter from E. S. Hill, General Superintendent, states that this road expects to lay 10 miles of new rails this month and to complete 100 miles of gravel ballast on the Illinois portion of the main line. Several trestles in Indiana and Ohio are being replaced with stone and iron bridges.

Merchants' Terminal Railway.—This company has been incorporated in Illinois, with a capital stock of $750,000, to build a belt line in the city of Chicago, connecting the terminals of the Pennsylvania, Chicago & Alton, Chicago, Burlington & Quincy and the lake traffic terminals. The line is projected to extend from a point on Stewart avenue, south of West Twelfth street, running north and northeast to a point near West Harrison street, on the west bank of the South Branch of the Chicago River.

Mexican National.—President Raoul denies the report that the company has decided to change the gage of its track in September from 3 ft. to standard.

Mexican Roads.—A government concession for a railroad in Yucatan Peninsula from Merida east to Valladolid, about 100 miles, has been modified. The line has been built as far as Temax, and by the new plans it will extend to Valladolid by way of Tunkax and Tzitas. From Tzitas a branch will extend to Tizimim, which lies north of Valladolid. According to the modified concessions the government agrees to give the company a subvention of $6,250 for every kilometer of railroad constructed and accepted, payable in 5 per cent. interior redeemable debt bonds created by law of Sept. 6, 1894, which the company agrees to take at par.

Omaha Northern.—This company has been incorporated in Nebraska with capital of $100,000 to build a line from Omaha, northwest, up the Missouri Valley, about 140 miles, to a point on the Missouri River opposite Yankton, S. Dak. The incorporators are: George W. Covell, A. S. Churchill, Philip E. Winter, A. E. English and W. F. Conger.

Quakertown & Eastern.—The rails for this road are being distributed between Quakertown and Riegelsville, Pa. The line is 10 miles long. The grading is about completed, and it is expected that freight trains will be running over this portion of the road next month. The line as projected runs from Quakertown, 22 miles northeasterly, to Easton, Pa.

San Francisco & San Joaquin Valley.—The extension of this road from Fresno south 110 miles to Bakersfield, is being pushed rapidly. Trains have been running to Hanford, 28 miles south, since May 23. Grading has been completed about 20 miles south of Hanford through Tulare County. Work will not begin in Kern County until all the right of way is secured.

Sumpter & Bourne.—This company has been incorporated to construct a railroad in Baker County, Or., extending from Sumpter, a point on the Sumpter Valley Railroad, northwest to Bourne, about 15 miles. The incorporators are B. L. McLean, J. H. Clarke, Thomas McEwan and Arthur Philbrick.

Superior, Hutchinson & Little Rock.—This company was incorporated in Kansas July 24, with capital of $10,000,000, to build a road from Ft. Smith, Ark., northwest about 400 miles to Superior, Neb., via Tahlequah, I. T., capital of the Cherokee Nation; Wichita, Kan., and Hutchinson. This company, according to reports, will absorb the Hutchinson & Southern and the Kansas Midland to form a part of the proposed line. The Hutchinson & Southern extends from Medford, Oklahoma, north 104 miles to Hutchinson, Kan. It went into the hands of a receiver in 1893. The Kansas Midland extends from Wichita, Kan., northwest to Ellsworth, 107 miles. It has been operated under lease by the St. Louis & San Francisco, but is now an independent line under a Receiver.

Tifton, Thomasville & Gulf.—The charter for this proposed line has been granted by the Secretary of State of Georgia. It is projected to run from Tifton, by way of Obe and Moultrie, about 50 miles southwest, to Thomasville, Ga., a point on the Savannah, Florida & Western. Among the Directors of the company are George W. Parrott, of Atlanta, Ga., and W. W. Ashburn, of Eastman, Ga.

Washburn, Bayfield & Iron River.—The contract for building this road has been let and work has been begun. The town of Bayfield, Wis., on July 6 voted $25,000 bonds, and Bayfield County last year gave $240,000 for this line. The road will extend from Washburn southwest about 26 miles, to Iron River, Wis. A branch of 13 miles is proposed to connect Washburn with Bayfield.

West Clarion.—This company was chartered in Pennsylvania July 21, to build a line in Jackson County, Pa., from Brockwayville, about two miles to the West Clarion Mines, in Synder Township. The connection at Brockwayville will be with the Ridgeway & Clearfield, which extends from Ridgeway south to Falls Creek, Pa., 27 miles, and is operated under lease by the Pennsylvania. The capital stock of the new company is $20,000. The officers are given in another column.

Electric Railroad Construction.

Akron, O.—The County Commissioners have granted a franchise to the Akron Street Railway & Illuminating Co. to lay a double track on North Hill. A similar franchise was granted about a year ago, but injunction suits by property owners stopped proceedings. The company works 22 miles of track in the city and suburbs, the line extending to Cuyahoga Falls and Silver Lake.

Allegheny, Pa.—The Mt. Troy & Reserve Township Traction Co. has secured right of way for its entire line and grading was begun about two weeks ago. It is intended to have the line in operation by October. The contract is held by Jolly Brothers, of Coraopolis, Pa., and the engineers in charge are Trimble & Miller, of Pittsburgh. The company was chartered July 2, 1892, and a franchise was granted by the Allegheny City Council last February. The road will run from the junction of Branch and Lowrie streets, Mt. Troy, through Wicks Lane to Evergreen, about 10 miles. It is proposed to do a general passenger and freight business.

Appleton, Wis.—The Fox River Valley Electric Railway Co. was incorporated in Wisconsin, July 22, with a capital stock of $200,000. The incorporators are: Henry C. Payne, Charles F. Pfister, B. K. Miller, Jr., F. G. Bigelow and Henry D. Smith. The company proposes to build an electric road from Neenah, Wis., northeast about 15 miles to Kaukauna, through Menasha and Appleton. The principal office will be in Appleton.

Beaver Falls, Pa.—The contract for building the Riverview electric road has been given to Simon Harold. The road will be two miles long, running from the Pittsburgh & Lake Erie station in Beaver Falls west across the town to the heights, connecting there with the Beaver Valley Traction Company's line. The company's officers are E. L. Hutchinson, President; F. W. Walker, Secretary; F. G. Barker, Treasurer.

Boston, Mass.—On July 25 the West Roxbury & Roslindale Street Railway formally opened its new branch line from Spring street, West Roxbury, through Germantown to the Dedham line at Bussey street. The company proposes ultimately to extend its line from Bussey street through East Dedham to Oakdale.

Butler, Pa.—The Butler Electric Traction Co. has recently been incorporated with a capital stock of $50,000, of which $5,000 has already been paid in. The company proposes building an electric road at Butler. T. B. Clawson, Warren, Pa., is President.

Chautauqua, N. Y.—The Westfield, Mayville & Chautauqua Railroad Co. has been granted a franchise to build a road between the points mentioned in the title.

Cleveland, O.—The Cleveland, Painesville & Eastern has let a contract to build 15 miles of its proposed western extension, to George M. Huss, of Chicago. Christy Brothers, Akron, O., have the contract for the overhead construction. It is expected that the extension will be finished by Nov. 1. The company owns its line from Euclid, O., to Painesville, 20 miles, and uses the tracks of the Cleveland Electric Railway between Euclid and Public Square, Cleveland, 10 miles.

East Liverpool, O.—The East Liverpool & Lisbon Electric Railway Co. was incorporated at Columbus, O., July 23 with a capital stock of $500,000. The principal business of the road is expected to be freight traffic and it is proposed to open up certain coal lands in the interior of Columbiana County. The incorporators are Daniel Moynahan, G. A. Steinbrenner, Jonathan Head, S. H. Talles and F. H. Goff.

Great Falls, Mont.—A press report states that at the next meeting of the City Council an application will be made for a street railroad franchise from Great Falls to Great Falls Park, and also for a right of way on some of the principal streets in Great Falls.

Lake Forest, Ill.—The City Council has given a franchise to the Bluff City Electric Street Railway Co. to build 1¼ miles of road through Lake Forest, on Depot avenue. The franchise will run for 50 years. The Bluff City Electric Railway Co. proposes to build a road from Waukegan, south along the lake front to Chicago. Right of way is now owned by the company from Waukegan through Lake Forest to Highland Park. Work is to begin at once at the latter place, as the franchise requires that portion of the line to be built before Jan. 1 next.

Milford, Mass.—The Railroad Commissioners have approved the extension of the Milford, Holliston & Framingham electric road to Bellingham, an adjoining town. The road, which is now 12 miles long, has been operated since May 15, 1896. The company's capital stock is $150,000, but no bonds have been issued.

New Brunswick, N. J.—The Brunswick Traction Traction Co. has applied to the Bridgewater Township Committee for a franchise to extend its line to Somerville, N. J., over the public highway now occupied by the tracks of the New York & Philadelphia Traction Co. The Brunswick Traction Co. was organized May 14, 1895, and has bought and now operates the New Brunswick City Railway. The company's capital stock is $500,000, and there is no funded debt.

Oneonta, N. Y.—The New York State Railroad Commission has granted an application of the Oneonta & Otego Valley Railway Co., for permission to build 10 miles of electric road in and about Oneonta. This company was incorporated last month and has secured the franchises of the Oneonta Street Railway Co. Its capital stock is $100,000.

Patchogue, L. I., N. Y.—The trustees of this village have given a franchise to the Patchogue & Port Jefferson Traction Co. to build an electric road on Ocean avenue and North Ocean avenue. The road is to be about 15 miles long from Patchogue, north through Canaan, Waverly, Seldon and Terryville to Port Jefferson. Surveys were made in the spring.

Perryville, Pa.—The Northern Electric Street Railway Co. has recently been incorporated to build a line between a point on the Perryville Plank road and this town, about four miles. The company's capital stock is $24,000, of which $2,400 has been paid in. M. K. McMullen, Allegheny, Pa., is President.

St. Louis, Mo.—The City Council July 20 passed the bill authorizing the building of the proposed North & South Railroad. The bill provides that the line is to be built within two years from the approval of the ordinance. The franchise will run for 50 years and the compensation fixed is $10,000 a year for the first 10 years, $15,000 a year for the second 10 years and $20,000 a year for 30 years.

Winchester, Mass.—The new Arlington & Winchester Electric Railroad was opened to the public on Thursday last. The line runs along the famous Mystic lakes from Winchester to the center of Arlington, connecting in the latter town with the West End road for Boston, and at Winchester with the North Woburn line for Woburn and Medford, and with the Mystic Valley line, of which it forms a part. Colonel and Senator C. F. Woodward is President of all the Mystic Valley roads, which include the Mystic Valley, the Wakefield & Reading, Reading & Lowell, and Woburn & Stoneham roads. It is probable the entire five roads, now run as one, will soon be consolidated under general laws. The intention is to build a new line immediately from Wakefield to Peabody, via South Lynnfield. If the Railroad Commissioner give permission to cross the Boston & Maine tracks at grade the line will run directly east from Wakefield; otherwise through North Saugus.

GENERAL RAILROAD NEWS

Atchison, Topeka & Santa Fe.—Attorney-General A. A. Hurd, of this company, has paid to the officials of Wichita County, Kan., $42,000 in consideration of the release by the county of the company from its obligation to operate the line in that county. The line did not pay expenses and the company has abandoned it. It is extended as far as Selkirk, Kan., running parallel for about 25 miles to the track of the Missouri Pacific.

Baltimore & Ohio.—Judges Goff and Morris, in the United States Circuit Court at Baltimore, July 23, granted the petition of Receivers Cowen and Murray to issue $2,345,550 in Receivers' certificates to be used for new rolling stock, thus overruling the objection of the Mercantile Trust Co., of Baltimore, referred to in this column last week. On the same day these judges decided to allow the trustees under the collateral mortgage bonds of £1,600,000 on the Baltimore & Ohio & Chicago to ask in the courts of Indiana, Illinois and Ohio for the appointment of separate Receivers for that division, preliminary to the foreclosure of the mortgage. A petition was filed by the Union Trust Co., of New York, asking that the Court direct the Receivers to pay the interest accruing, and falling due Aug. 1, 1897, on the $10,000,000 second mortgage bonds of Feb. 10, 1885, of the Pittsburgh & Connellsville, which are guaranteed by the Baltimore & Ohio. This petition will be argued Sept. 28.

Central Pacific.—Holders of first mortgage gold bonds maturing Jan. 1, 1898, are notified that they must deposit their bonds with the agents at 30 Broad street, New York, before Jan. 1, 1898, in order to participate in the benefits of the readjustment of the company's bonded debt, which is now being effected.

Central Railroad of New Jersey.—The earnings for June and for the six months ended June 30 were as follows:

June:	1897.	1896.	Inc. or Dec.
Gross earn	$1,026,082	$1,041,237	D. $15,155
Oper. expen	651,792	654,343	D. 2,551
Net earn	$374,290	$386,894	D. $12,604
Six months:			
Gross earn	$5,526,595	$5,742,593	D. $215,998
Oper. expen	3,917,240	3,891,809	D. 174,569
Net earn	$1,809,355	$1,850,784	D. $41,429

Central Vermont.—The first mortgage bondholders have applied to the courts for the removal of the present

Receivers and the appointment of a Receiver in their interest.

Chicago & Eastern Illinois.—This company is having filed in the counties of Illinois and Indiana, through which its road passes, a contract between the railroad company and the Central Trust Co., of New York, limiting the issue of bonds by the railroad under mortgage, made in November, 1896, to $30,000,000, including $8,000,000 reserve bonds to be used for redeeming bonds outstanding.

Chesapeake & Ohio.—The earnings for June and for the year ended June 30 were as follows:

June:	1897.	1896.	Inc. or Dec.
Gross earn	$861 527	$820,145	I. $41,382
Oper. expen	601,391	548,876	I. 52,515
Net earn	$260,136	$271,269	D. $11,133
Year:			
Gross earn	$10.708,182	$10,221.131	I. $487,051
Oper. expen	7,286,769	6,963,153	I. 323,616
	$3,421,413	$3,257.978	I. $163,435

Colorado Midland.—The report of the Reorganization Committee, as given in our issue of June 25, is opposed by minority bondholders whose holdings are less than $500,000. They have organized, with William F. King, President of the Merchants' Association of New York, Chairman, and James B. Dill, Counsel. They claim that the plan is for the benefit of the Atchison, Topeka & Santa Fe, that it permits the Reorganization Committee to act for themselves as well as for representatives, and that the committee is not under obligation to report its transactions. The plan has been ratified by the first and second mortgage bondholders.

Columbus, Hocking Valley & Toledo.—Judge Taft, of the Federal Court, at Columbus, O, has issued an order authorizing Receiver N. Mansarrat to issue $500,000 Receivers' certificates at five per cent., the proceeds to be used to replace Receivers' notes outstanding. The Receiver was authorized to pay claims aggregating $162,078 27. This road went into the hands of a Receiver on Feb. 25. J. P. Morgan & Co., of New York, announce to certain bondholders that they must deposit their bonds not later than Aug. 14 in order to participate in any plan of reorganization.

Kansas City, Arkansas & New Orleans.—The United States Court at Little Rock, Ark., has directed C. Waters, Master in Chancery, to postpone the sale of this road from Aug. 6 to the first Monday in January, 1896. This line as projected was to extend across the State of Arkansas south to the Louisiana state line, about 300 miles Only 7 miles have been built, extending from Worthen Junction south to Stuttgart. About 38 miles have been graded south from Stuttgart. This road was charted in 1891 and was sold under foreclosure to the present company in 1893.

Louisville, Evansville & St. Louis.—The receivership of this road has been extended by Judge Woods, of the Federal Court, over the Evansville, Rockport & Eastern upon request of the bondholders of the latter company. The Evansville, Rockport & Eastern runs from Evansville northeast through Gentryville to Jasper, Ind., 55 miles, with a branch from Gentryville to Rockport, 16 miles. It was consolidated with the Louisville, Evansville & St. Louis Nov. 1, 1881.

Mexican International.—By agreement between the company and the bondholders an arrangement has been made to refund the outstanding $15,134,000 first mortgage four per cent. bonds. They will be replaced by £1,200,000 4½ per cent. 50-year bonds, $4,635,000 four per cent. 80-year first mortgage bonds and $4.499,000 income bonds. By this arrangement the fixed charges for interest will be reduced from $605,360 to about $448,658 per annum. The income bonds are to be used to build about 369 miles of new road and for betterments. The main line of this road extends from Ciudad Porfirio Diaz on the Rio Grande southwest to Durango, Mex., 540 miles, with branches aggregating 119 miles. By the provisions of the charter the road is limited in its issue of bonds to $30,000 per mile.

Oregon Short Line.—Notice is given to the holders of the first mortgage 6 per cent. bonds that the coupons which mature Aug. 1, 1897, will be paid on and after Aug. 2 upon presentation to the Guaranty Trust Co., 65 Cedar street, New York, or at the office of the Oregon Short Line, 37 Ames Building, Boston.

Pittsburgh, Fort Wayne & Chicago.—The Directors of this road will issue $282,692 "special guaranteed" or betterment stock under the terms of its lease with the Pennsylvania Company. There is now outstanding $18,882,457 of this stock. This road has been operated by the Pennsylvania Company since July 1, 1869, under lease for 999 years, the Pennsylvania Company guaranteeing all the obligations and paying dividends at seven per cent.

Portland & Rumford Falls.—This company will pay on and after the first day of October at the office of Kidder, Peabody & Co., 113 Devonshire street., Boston, or at the Portland Trust Co.'s office, Portland, Me., all bonds issued and now outstanding given to the Old Colony Trust Co., of Boston, dated Oct. 1, 1892. The price offered is a premium of five per cent. on the principal.

St. Louis, Alton & Terre Haute.—This company desires to redeem before maturity its first mortgage and terminal 20-year gold bonds dated July 2, 1894, offering to pay $105 for each $100 of principal, with accrued interest, when presented at its agency, No. 214 Broadway, New York City.

Southern.—The earnings for June and for the year ended June 30, 1897, were as follows:

June:	1897.	1896.	Inc. or Dec.
Gross earn	$125,622	$112 426	I. $13,196
Oper. expen	94,394	98,826	D. 4,432
Net earn	$31,228	$13,600	I. $17,628
Year:			
Gross earn	$1,605,546	$1,634,093	D. $28,547
Oper. expen	1,103,041	1,133,212	D. 30,171
Net earn	$502,505	$500,881	I. $1,624

Terre Haute & Logansport.—The United States Circuit Court, at Indianapolis, Ind., has issued a decree ordering the sale of this road. The line extends from Rockville northeast to South Bend, Ind., 160 miles. It was leased by the Terre Haute & Indianapolis from Dec. 1, 1879, for 99 years. Both lines are now operated by the Pennsylvania Company.

Union Pacific.—A petition has been filed in the United States Circuit Court at Omaha, Neb., signed by all parties interested, asking that Judge William D. Cornish be appointed Special Master to execute the official sale of this road. The receivers of the road are paying at the office of the Union Trust Co., New York City, or at 92 Ames Building, Boston, the July 1 coupons on the first mortgage bonds with 13 cents accrued interest. The bonds which matured July 1, 1896, and July 1, 1897, aggregating $6,475,000, are being paid in full.

Vancouver, Klickitat & Yakima.—The sheriff's sale of this road, advertised to take place at Portland, Or., July 14, has been postponed for 30 days. This sale was ordered to satisfy a judgment of $38,000 in favor of the Commercial National Bank and the First National Bank of Portland. This road was built by local capital about 10 years ago and extends from Vancouver north 15 miles to Amboy, Wash.

Electric Railroad News.

Asbury Park, N. J.—Judge Kilpatrick, of the United States Circuit Court, has filed an opinion declaring a bond issue of $75,000 to the Asbury Park & Belmar Railroad Co. invalid. The road, which was to be two miles in length, was capitalized at $75,000. It appears that the contract was made with T. B. Wilson to build the road and receive for his work a large number of shares in the capital stock and bonds. The road is in the hands of a Receiver.

Baltimore, Md.—Two mortgages were recorded July 23, both in favor of the Maryland Trust Co., one, amounting to $552,000, being given by the Falls Road Electric Railway, and the other, for $310,000, by the Baltimore & Northern Electric Railway. These mortgages are to secure bonds for an equal amount, issued to build the line from North Charles street, Baltimore, to Mt. Washington and vicinity, seven miles. The charter for this road is held by the Falls Road Company, which expects to have it in operation by Sept. 15, when the company will be consolidated with the Pikesville, Reisterstown & Emory Grove Railroad and the two lines will be acquired by the Baltimore & Northern.

Du Bois, Pa.—The property and franchises of the Du Bois Traction Co. will be sold under foreclosure by the sheriff at Clearfield, Pa., Aug. 6. The company's liabilities are estimated at about $75,000 and its assets at $100,000.

New Haven, Conn.—During the heavy rains last week the third rail of the road between New Britain and Hartford was submerged in water for stretches of several hundred feet. No difficulty was reported from loss of current to the earth.

Newton, Mass.—The Massachusetts Railroad Commissioners have authorized the Commonwealth Avenue Street Railway Co. to issue $110,000 capital stock in addition to the $65,000 now outstanding, to pay and capitalize its floating debt. An issue of $10,000 20-year five per cent. bonds is also authorized by the Commissioners.

Racine, Wis.—The Belt City Street Railway Co. was sold on July 19 to Frank H. Miller for $150,000. By this purchase the bondholders secure the property and will reorganize the company with a capital stock of $200,000 and with a bonded indebtedness of $250,000. It is stated that about $25,000 will be expended in improving the line. Jackson I. Case will probably be re-elected Manager.

Taunton, Mass.—The Brockton, Bridgewater & Taunton Electric Railroad Co. has been granted authority by the Massachusetts Railroad Commissioners to issue $200,000 20-year bonds, bearing five per cent., to build and equip its proposed road. The company is further authorized to issue $225,000 capital stock, $200,000 original and $25,000 increase.

Warren, Pa.—Judge Noyes recently gave a decision in the case of the New York Central & Hudson River Railroad against the Warren Electric Railway Co., dissolving the injunction restraining the latter company from crossing the tracks of the Dunkirk, Allegheny Valley & Pittsburg (leased by the New York Central), in Conewango Township, so far as to allow the street railroad company to make a grade crossing by putting in a standard jump crossing.

TRAFFIC.

Traffic Notes.

The Chicago roads report a fairly good volume of general business. Grain has not yet commenced to move in any large quantity, but the indications are for an early movement. Crop prospects continue good.

There is no material change in the Chicago rate situation but considerable pressure is being brought upon the all-rail lines to make reductions to meet the cut rates of the steamship lines between New York and Galveston.

There is a likelihood of a shut-down in the Kansas coal mines, which may embarrass some of the roads. So far, however, the roads have been able to get all the coal required, but in some instances train service has been reduced as a matter of precaution.

The Railroad Commissioners of California have decided that the action of the North Pacific Coast and the San Francisco & North Pacific roads, in making lower commutation rates for women than for men, is an unlawful discrimination between persons.

The conference between the New York and Galveston steamship lines and the Texas roads held at New York last week was a complete failure. The old steamship lines flatly announce their intention of continuing the war until the Lone Star line withdraws its boats from the Texas business.

As the result of a meeting of the Northern lines, representatives of the Lake Michigan and Lake Superior lines also being in attendance, it was decided to reduce the rate on grain products (flour) from Minneapolis to New York from 22½ cents to 20 cents per 100 lbs. during the month of August.

The squabble over G. A. R. excursion tickets in Buffalo at the time of that reunion in Buffalo in August has been settled. The Western roads have decided to send one or more of their own representatives to Buffalo to act as joint agents and properly execute the return portions of all tickets reading west of Chicago.

The New York Merchants' Association has petitioned the Southeastern Association to rescind its action granting open unlimited rates next month and to authorize reduced rate tickets to members of the Merchants' Association and their families on Aug. 10 to 14, inclusive, and Aug. 27 to 31, inclusive, with return limits of 30 days. The objection to the present arrangement is that the Merchants' Association would be unable to guarantee that none but members would use the tickets. The dates fixed by the Joint Traffic and Trunk Line Associations for similar excursions are Aug. 7 to 10, inclusive, and Aug. 27 to 31, inclusive.

The movement of grain to Europe has now become very heavy, with a promise of a continued large movement. The assurance of good crops of corn and wheat in this country this year, and the rise in prices consequent upon the comparative scarcity of grain in European countries, both tend to make a heavy export demand. During 11 days ending July 22, 62 steamers, with an aggregate capacity of 7,337,600 bu., were chartered at New York for grain, many of them to sail, however, from Baltimore, Newport News and other ports. Many vessels are being held back, the owners refusing to charter them for many trips in the future. Last year charters were made for several weeks or months at one time, and the owners making these contracts lost money, the rates advancing a short time afterward. The rate per bushel on grain to Cork was on July 1 less than 3s., and on July 10 had risen to 3s. 3d.

Texas Cotton Rates.

The Texas Railroad Commissioners have issued their new cotton tariff, effective Aug. 13. The rate in cents per 100 lbs. between Texas points not otherwise provided for, ranges from 15c. for 30 miles and less to 54c. for 165 miles or more. The rate is fixed for every five miles between 30 and 165. Shippers may have their cotton delivered uncompressed on giving due notice to the railroad and inserting in the bill of lading the words "to go through uncompressed." Special rules regulate compressing.

The New Central Association Mileage Tickets.

The articles of organization and rules of the new Central Passenger Association mileage-ticket bureau, as formally agreed upon, have been given out by Commissioner F. C. Donald. Under the plan the interchangeable 5,000-mile ticket now in use will probably be retained. As regards the new 1,000-mile ticket adopted, it is a "blind ticket," having no provision for signature of the passenger. The passenger, however, does sign a slip when he purchases the ticket, which is sent into the auditor and to the mileage bureau, the principle being that of the Southern ticket. The ticket bears nothing except the contract. The book sold by the Central Passenger Association is a 1,000-mile book for $30, with a rebate of $10, to be paid by the mileage bureau of the Central Passenger Association. The 1,000 mile book is deemed most convenient for that territory, the majority of trips being short. The book contains the continuous-trip feature, but perforated down the center. When the passenger desires to make a trip he presents the same to the ticket window. The ticket clerk tears off the entire strip clear across the page and issues an exchange ticket therefor. The exchange ticket bears space for the passenger's signature, but he does not sign it at the ticket window, signing it on the train. Both sides of the perforation will contain a designating mark, showing what line issues the ticket. For instance, the Pennsylvania ticket will be "P. L." When the strip comes into the Auditor's office, therefore, the Auditor will detach one side of the strip, to use as his charge against the Pennsylvania line for the trip made over their line. For instance, the Monon gets a collection bearing "P. L." The Monon Auditor will detach that part of the strip, send it to the Pennsylvania line, as a charge against it for the value of this strip, retaining the other portion, which is sent to the mileage bureau, together with the exchange ticket

This ticket will take the place of all other forms of ticket, and is a Commissioner's ticket. While the Commissioner does not sell it, lines send their requisitions into the Commissioner for their supply, and he has ordered them from the printer and delivered direct to the issuing line. The bill is sent to the Commissioner, who "O. K.'s" it and turns it over to the individual line for payment. This gives the Commissioner entire supervision over the tickets ordered by the different companies. In other words, there will be no individual tickets sold. The present 5,000-mile photographic ticket sold by the Commissioner will be continued, although there is little or no demand for it. Settlement is to be made between lines on the basis of collections, as previously described.

A blanket bond is taken for $300,000, $30 000 of which will apply in case of any individual road, and is for the purpose of securing proper conduct of the business and carrying out of the obligations of each line under the agreement, and also to prevent irresponsible roads from getting tickets, selling them, and not making proper account thereof, and also to secure prompt payment of each line's proportion of expenses.

In the formation of the bureau each line is to deposit $100 to defray the running expenses thereof.

The Western refunds will be paid on the same basis as is now operative in the mileage bureau; that is, the signatures on the back of the strips will be compared with the original stub, which bears the signature of the passenger at the time of purchase, and which is sent in by the ticket agents. Both the stub and the collections, as well as the exchange ticket, are sent to the Commissioner for comparison.

Daily reports of sales of mileage tickets by different agents are to be sent to the Commissioner, so that he will have before him at all times as promptly as sales are made a description thereof. This is intended to prevent the handling of the mileage tickets by brokers.

The question of form of the mileage ticket, as well as the form of the exchange ticket, has been left to a committee of three, with power to act. These forms have not yet been prepared, but the association has agreed to be bound by the committee's action and to accept whatever form is presented; but the above are the main features of what the forms are expected to embody.—*Chicago Times-Herald.*

Eastbound Shipments.

Eastbound shipments from Chicago and Chicago junctions to points at and beyond the Western termini of the trunk lines for the week ending July 22 amounted to 57,415 tons, as compared with 56,730 tons the preceding week. This statement includes 17,202 tons of grain, 3,953 tons of flour and 14,182 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	Week Ending July 22.		Week Ending July 15.	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio	4,000	7.0	3,663	6 5
C., C., C. & St. Louis	2,130	3 7	2,722	4 8
Erie	9,244	16 1	8,424	14.8
Grand Trunk	4,967	8 5	6,765	11.9
L. S. & M. S.	4,918	8 6	4,184	7.4
Michigan Central	4,392	7 6	2,803	4 9
N. Y., Chi. & St. L.	13,909	24.2	12,260	21.6
Pitts., Cin., Chi. & St. Louis.	4,142	7.2	4,746	8.4
Pitts., Ft. Wayne & Chicago	6,981	12.2	7,786	13.7
Wabash	2,792	4.9	3,377	6.0
Totals	57,415	100.0	56,730	100.0

Lake shipments last week were 136,424 tons.